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THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME IX.

EDITED BY G. WHARTON SIMPSON.

Nulla recordanti lux est ingrata.—MARTIAL.

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PREFACE

A PREFACE generally contains the last words an author has to add to his volume. There is really no solecism in such after-words being styled a "preface," inasmuch as they are actually intended to be prefatory to the work, and to be read first by the reader. The author, reviewing his completed work, sees what most requires explaining, qualifying, or enforcing, and avails himself of a common custom thus to make a few preliminary suggestions to his readers. The preface to a periodical publication is, however, prefatory in no sense except its position in the volume. It is read as well as written after the volume is completed, and is really rather a postscript or epilogue. The postscript of a letter is said often to contain the gist of the whole; the epilogue of a drama generally explains something which was not made clear in the action. We have, however, no especial point to add, no explanation to make: our twelve months' labour is before our readers; and it has, we hope, carried its meaning with it in its periodical course. We simply write a preface because it gives us the customary opportunity of speaking more familiarly than usual with many thousands of readers whom we feel to be, in a certain sense, personal friends. It is one of the privileges of the Editor of a class Journal like ours, that, being—unlike the Editors of English Journals generally—known by name to all, and personally to many, of his readers, whilst his responsibilities are increased and brought more closely home to him, so also are the interchanges of personal kind feeling, and the tenders of aid in various ways, which do much to strengthen his hands, and make his position pleasant and honourable, as well as onerous and responsible.

"It is always pleasant," writes Montaigne in one of his delightful Essays, "to read things that are written by those who have experienced how they ought to be carried on." This has ever been our conviction, and it is for this reason that we have ever aimed at securing the essentially practical element in the contributions to our pages; and it is to this that we refer—and we do not mention it in the spirit of self-laudation, but rather as one who has been an agent in securing benefits than as the personal benefactor—it is to this we refer our continued and increasing success, a success of which we know it is as pleasant for our readers to be assured, as it is to us to record. We do not depreciate the more purely literary department of photographic journalism, nor underrate the strictly scientific and suggestive contributions, in giving prominence to the practical phases, especially when practical articles are written by men whose reputation for the highest practical skill in their several departments is known to all men, such as are many who have during the past contributed to our pages the fruits of their experience.

Of the year that has just passed we need say little here. It has been in many respects one of the most marvellous and fruitful years in the brief history of our art. Rich in suggestion and rich in result, our pages chronicle the progress in every part of the world of a year in many respects unparalleled in interest and importance.

Of ourselves we would say less, either in reference to our work in the past or in making pledges for the future. Our work has at least the advantage of being a labour of love, and lacks nothing which heartiness, assiduity, and earnestness could give it. For the future we will simply say that we will still endeavour to make the PHOTOGRAPHIC NEWS worthy of the generous confidence reposed in it by a very large constituency. The arrangements for a continued maintenance of interest we need not specify now, as they will duly appear. We conclude these brief afterwords by wishing all the most cordial greetings of a joyous season to each of our readers.

15 & 16, GOUGH SQUARE,
December 28th, 1865.

THE PHOTOGRAPHIC NEWS.

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PHOTOGRAPHY DURING THE YEAR.

An exciting and interesting year to photographers has just closed. The subject of permanent printing, always regarded as important, has been during the past year paramount in the attention of all interested in the art. Very early in the year we had to announce the receipt of some of the most perfect examples of photography we had seen, which were described as carbon pictures. Shortly afterwards Mr. Swan read a description of his process; a host of experimentalists were quickly engaged in producing carbon prints, and a mass of information was collected and recorded from which a far more general knowledge of the peculiarities of carbon or pigment printing, its strength and weakness, was gleaned than had ever been familiar to photographers before. Until Mr. Swan's pictures were exhibited a general impression prevailed in this country that the barriers to carbon printing existed less in the manipulation than in the quality of the results. It was believed that carbon prints were generally and necessarily crude, hard, and coarse, with poor colour and imperfect gradations, and altogether wanting in delicacy. Mr. Swan showed that the most exquisite gradation was possible. The perfection of the results received universal recognition; but several other considerations remained, and remain, much more doubtful. The behaviour of different samples of gelatine when combined with the pigment and bichromate was altogether inexplicable, some samples becoming spontaneously insoluble throughout, without any assignable reason. This introduced a difficulty in the selection and preparation of the materials. The manipulations at first appeared to be complicated, and really were somewhat troublesome; and the print yielding no sign of the progress of printing, rendered the exposure a matter of judgment or guess-work. These and some other considerations, the uncertainty of exposure most of all, have tended seriously to retard anything like a general adoption of the process. The results are so beautiful, and the promise of permanency they possess so seductive, that we are very unwilling to believe that the process is destined to remain a beautiful possibility only.

The last improvements of Mr. Swan have materially facilitated manipulations, and his announced intention, for the fulfilment of which we look with considerable interest, of issuing prepared tissue which can be excited by floating at any moment on a chromic solution, will tend to remove all manipulative difficulties. The question of exposure only remains: this Mr. Swan proposed to remedy by the employment of a simple actinometer. The experience of one year has shown us the difficulties of the process; we can only earnestly hope that the experience of another will suggest a certain and successful remedy for those difficulties, and that a good carbon process may be found as practicable as it is desirable.

Mr. Pouncy has made considerable progress with his printing-ink process, both in sensitiveness and beauty of result. It is matter for some regret that either from the uncommunicativeness of the inventor, or some other cause, this process does not occupy more of the attention of some of our enterprising experimentalists, as it contains much that is worthy of attention.

The hopes raised by the progress of the carbon process had not been altogether blighted by the difficulties which surrounded it, when interest was diverted from the subject by another announcement, which in its promise eclipsed all others. A new discovery was proclaimed, unequalled in its simplicity, unsurpassed in its results, undoubted in its permanency. The sensitive compound was contained in one vehicle, collodion. This was poured on the paper, then dried, exposed, toned, sponged for a few moments, and the picture was finished. We saw a picture produced in this way, and the simplicity of the operations was only equalled by the excellence of the results. We subsequently tested a print by applying some of the re-agents which might anticipate the effect of time and exposure, and we found that it resisted the action of such re-agents better than an albumenized silver print, thus confirming the promise of permanency. But when the specification was published and it was found that the process was rather new in detail than in principle, and that silver was the source of the image after all, hopes fell very considerably. The simplicity of the process was considerably diminished when it became apparent that some fixing process, and consequently prolonged washing would be necessary; and its permanency became in the eyes of many less certain. It was found, moreover, on experimenting that the best conditions as to quality and preparation of collodion, quality and preparation of paper, proportion of sensitive salts, mode of toning, &c., if ascertained, were certainly not published, and that much remained to be learnt in these directions.

Nevertheless in the Wothlytype process, we still affirm that there is much that is beautiful and promising. Herr Wothly may not have discovered a new principle, but he certainly made known a new fact, namely, that perfect photographic prints could be produced by coating paper with a combination of silver and uranium in collodion. Photographers had seen uranium prints before, but none approaching in excellence to those of Herr Wothly. He has at least established this fact: how far it can be utilized, and how far the process will take a place among the practical commercial printing processes remain to be seen. The rumours which have been afloat as to the reservation in publishing the process, have done much to shake confidence. We are not in a position to clear up this question: but we have reason to believe that any reticence has rather had reference to details of proportion &c., than to anything connected with the principle involved in the process.

Not less important we believe is our own discovery of the process of printing with chloride of silver in collodion. We have heralded our announcement of this process with very little circumstance or parade, and may perhaps, therefore, be pardoned for expressing here a conviction that it is the germ of a printing process of the utmost importance. It is the simplest printing process we know, the most sensitive and the most economic, and we believe that it is capable of yielding prints, equal to the best by any other process. It requires verifying by more extensive practice, and we do not therefore enter further into the question here.

Two other photographic processes have been patented during the year. That of Mr. Fox, and that of Mr. Willis. The former has been described, but no details of the latter have transpired. We have some reason to believe however, that it is similar in principle to that of Mr. Fox. This depends upon the use of a chromic salt as a mordaunt for fixing a dye colour. The principle has often been suggested, and we believe to some extent carried out; but there is, notwithstanding, a novelty in Mr. Fox's process. In several suggested processes of this kind a paper is prepared with bichromate, exposed, then washed thoroughly to remove all the unaltered salts; after which it is submitted to the action of the dye, the oxide of chromium remaining in the exposed parts exercising a mordaunt influence, the colour is fixed in the shadows. In Mr. Fox's process the opposite of this takes place. Paper is prepared with sulphate of copper and bichromate of potash, *exposed under a transparency*, then submitted to the action of a solution of logwood, which is fixed by the mordaunt in those *parts upon which light has not acted*; these parts, forming the whites of the picture, have been made insoluble by the action of light, and do not therefore absorb the logwood solution. In Mr. Willis's process it is stated that a drawing may be reproduced without the aid of a negative, and this points to the probability of the processes being analogous, the drawing to be copied serving as a transparency. The permanency of prints produced in such colours, will, we fear, be doubtful.

Ordinary silver printing processes have been improving, both as regards results and economy. Weak silver baths, with or without nitrate of soda, and ammonia fuming seem to give better results, than were formerly obtained by strong silver baths.

In dry processes, there has not been much change. The tannin process has undergone various refinements and modifications, but a tendency appears to have set in to recur to the simplest modes of working it, Mr. Hughes having satisfactorily illustrated the fact that with ordinary materials, working well in the usual wet process, the very best results in tannin may be easily and certainly secured. The value of Mr. Leahy's discovery of alkaline development is, however, now one of the recognized facts of photography, and one which proves of immense importance in shortening exposures. Where the very greatest degree of rapidity is important, it is possible, or probable, that the modified processes will be found efficient; but it is clear from Mr. Hughes's experience, that excellent results, not wanting in rapidity, may be obtained with plates prepared in the simplest manner and alkaline development. Major Russell has settled, satisfactorily, many of the conditions of success in using bromide alone in tannin plates, &c., in getting thereby very rapid results. He has also shown the cause and remedy for a defect, with which photographers who have had experience in taking interiors, or views in which the objects have the light behind them, are very familiar. The defect in question gives, in the print, the hazy effect of light spreading from a strongly illuminated point, like the window in an interior, over the adjacent dark parts. Major Russell has shown that this defect is produced by light passing through the film, which is reflected back on the adjoining parts, producing the foggy defect in question. He has also shown that by painting the back of a plate with a yellow or red pigment the defect is entirely removed or much mitigated. The theory upon which the defect is explained, and the remedy based, is still unsatisfactory to some able scientific man, but the practical efficiency of the remedy appears to us to be beyond question. An animated discussion on the subject has been maintained during the year, and on the terminology employed to indicate the defect, which has been named by one section "blurring," and by another "nubation," neither of the names is good, but the last seems less liable to be misunderstood or applied to any other defect. It is to be hoped that the cause and remedy being known the defect will disappear and need no name. It is to be regretted that the controversy, as controversy involving no personal interest whatever, so often, unfortunately, does, became eventually unpleasant, some of the disputants forgetting their courtesy, attributing unworthy motives to those who honestly differed from them. It was high time, then, that the controversy should cease, and in these pages the subject is closed.

Some of the old processes continue to be practised with success. Captain Bonamy has been pre-eminently successful with the Fothergill process, a great accession of softness and cleanness being obtained by the wash of bromide, which he described in our pages. A series of pictures, we have recently received, before us, now attest the excellence of the process. A modification of the malt process, in which ordinary pale ale is used, has, in the hands of Mr. Penny, of Cheltenham, given very fine results.

The experiments of Messrs. Sayce and Bolton in producing dry plates without a nitrate bath have been the most successful of any of the efforts to discard that *bête noir* of the photographer. By forming bromide of silver in collodion, and using tannin as a sensitizer, they have produced dry plates yielding excellent results, a step of great importance, which we believe Mr. Sayce is following up very carefully. M. Gaudin and Herr Liesegang have experimented also in discarding the nitrate bath, and we have prosecuted some successful experiments in the same direction, adopting tannin as a sensitizer, and exposing the plates wet. We intend to pursue the subject further, when other engagements will permit.

In the chemistry of photography the chief researches of the year of practical importance are those of Dr. Hermann Vogel, contributed to our columns, relating to the behaviour of iodide of silver in the nitrate bath, and from which important information as to the cause and remedy of pinholes in negatives may be gathered.

Photolithography and photo-engraving have made some progress, but few novelties have been announced. The pictures of Mr. Osborne, Mr. Toovey, and Col. James at the last photographic exhibition all possessed very much merit. M. Placet's system of engraving appears to have much promise, but we have not seen any results. Mr. Swan has produced some photographic engravings in which we see so much promise that we are very anxious to see his process thoroughly worked out. Mr. Griggs of the East Indian Museum has also produced a very excellent system of photoblock printing, an example of which we shall shortly place before our readers.

Photographic enlargements have not made much headway in public estimation. A certain demand for them it is probable will always exist, but they do not seem likely to become very generally popular. Those exhibited by Dr. Van Monckhoven, produced by his new enlarging apparatus, have, however, won general admiration. In this country it is probable that enlargement must often be effected by means of artificial light. This has been managed successfully by several photographers, amongst the most successful of whom have been Mr. W. W. Woodbury and Mr. Aldis. We hope shortly to describe the appliances of the former gentleman.

Amongst the noteworthy facts of the year, has been the plentiful production of the metal magnesium, and the application of the light it yields to photographic purposes. It is probable that it may be successfully applied in photographing many dark interiors, hitherto beyond the reach of photography, such as those of the Pyramids, shortly to be undertaken by Professor Piazzi Smyth. To various special purposes in connection with portraiture, it has already been successfully applied.

A sensible diminution in the demand for card pictures has been experienced during the year, and various novelties have appeared ready to supply the place in public estimation. Amongst the most successful of these is the Diamond Cameo portrait, consisting of four busts, giving different views of the same head on one card, each punched into a convex form, giving an illusive effect of relief which is very pleasing. Another of the novelties in portraiture consists in the revival of prints on opal glass by Messrs. Helsby & Co., and others. Some of the results are very beautiful. Is it possible to obtain something with equal beauty of surface free from the fragility of glass?

Photo-sculpture has during the year found an opening and a home in England, and gives every promise, either in the able hands of M. Claudet, or of the company with which he is to be, or is, associated, of further illustrating the wondrous powers of our art, and the wondrous diversity of application of which these powers are capable.

The London Photographic Exhibition of the year, was regarded as a failure; that of Scotland recently opened, appears to be in many respects, a success. The photographic department in the International Exhibition of Dublin, to be opened in the forth-coming year, ought to be in every way completely successful. Every facility and every honour which can do justice to the art and conciliate photographers, are offered; we hope photographers will appreciate, and be worthy of the opportunity.

We have during the year, chronicled many other important improvements in apparatus, processes, and other matters connected with photography which it is unnecessary to recall here; but which aid in the general conclusion that our art is in all respects progressing, despite the puerilities which sometimes cling as parasites around it, despite misconceptions and misunderstandings amongst its votaries, and despite the occasional efforts of selfish men to clog its steps in order to serve vested interests. That it will advance in real excellence, in extensive application, and in public recognition is a fact as certain as the growth of civilization and the progress of man, and we may give a literal interpretation to the lines of the Laureate, notwithstanding that they were written with a very different:

For I doubt not through the ages, one increasing purpose runs,
And the thoughts of men are widened with the *process of the suns.*

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PHOTOGRAPHS ON A DEAD EYE AGAIN.

There are few things which possess so much vitality as a *canard*. Nothing can destroy it: it surpasses the phœnix, rising constantly stronger of wing and brighter in plumage, from its own funeral pyre. The story of the existence of a fixed image of the last object seen, remaining on the retina of a dead eye, arose, we believe, in this country, and received respectable indorsement through honest misconception of a physical phenomenon. The honest error soon dies a natural death, making but little struggle for existence. But the idea of such a phenomenon as the image of a murderer photographed on the eye of his victim was too good to be lost, and forthwith we find it turning up again as a definite fact, with all circumstance and the necessary vouchers for its literal truth. If we remember rightly, it was in France that the *canard* first assumed its full proportions. Next we hear of it in America, where it is still more perfectly organized, and a good photograph of the assassin is obtained after the victim had been thirty hours dead. The next flight of the *canard* is into Russia; from thence it visits San Francisco, and after that it turns up in Spain. The most respectable testimony, generally of an official kind, is always adduced in support of the statement, and the enlarged photograph taken from the dead eye is generally, although blurred and ill-defined in some parts, quite sufficient for identification. It is a noteworthy circumstance that the portrait of a murderer, so secured, generally wears a moustache, which is doubtless the invariable appendage of a murderer. It has been unfortunate for those in this country at all interested in the unquestionably veracious facts, that the evidence has always been very inaccessible, the circumstances transpire afar off, but generally in provincial and inaccessible districts as well. At length, however, we meet with a case which bears unusual evidence of authenticity, and also admits of satisfactory verification. A month or two ago our columns contained an extract from the *Gazzetta del Popolo*, giving circumstantial details of the phenomenon in question, on apparently excellent testimony, as occurring in Florence, the dead eye of a murdered woman is photographed by order of the police by a respectable photographer, and the portait of one of the men in custody is found on the eye of his victim. Nothing can be clearer or more satisfactory. We fortunately possess the means of communication with the photographer. The Hon. Warren Vernon is personally acquainted with him, and courteously volunteered, in a conversation we had with him on the subject, to write to the photographer for details, and, if possible, procure a copy of the photograph, and we have now the pleasure of submitting the reply received some weeks ago to our readers. We trust it will satisfy all sceptics as to the veraciousness of the various stories they have heard and seen.

Dear Mr. Vernon,—I find from your favour of the 28th ultimo, now also out there, [meaning in England], that news got about that I was the photographer who took a portrait of the unfortunate woman Spagnuoli, the victim of an assassin. This report is false, as it was not I who took the photograph, but Signor Alinari, and it was a mistake of our newspaper, the *Gazzetta del Popolo*, that wrote the first article on this fact, and mistook the name, putting my name in place of Signor Alinari.

As regards the photograph of the eye of the above named unfortunate woman, there appears to be nothing miraculous in it, as there is nothing but simply the photograph of an eye, without anything else of greater interest; as regards the pretended likeness, that is as far as I have hitherto been able to learn, not having been able to see it, but a person attached to the tribunal, or Court of Justice, for whom the photograph was taken, assures me of the fact, as far as I have thus explained it to you.

I am sorry not to be able to send you a copy of the photograph, which has been done solely for the tribunal, and for the present no copy of it has been made public.—Signed,

Pietro Semplicini.

Florence, Via Magenta, No. 5, *December*, 4*th*, 1864.

Since the above was in type, we have received from Dr. Hemphill, of Clonmel, a very able amateur photographer, the following interesting and conclusive details on the same subject:—

As the photographing the eyes of persons who have died a violent death seems lately to have been revived, I may mention a case that occured to me this summer, and gave me the unusual opportunity of examining the eye immediately after death. I am happy to say not the death of the patient, but of the eye. A woman was looking on at some men who were cutting down a large tree in a demesne near this, when unexpectedly the tree fell in her direction, and she was so terrified that she was unable to escape; on being lifted from the ground it was found that one of her eyes was protruding from the socket, and she was immediately sent in to me. I found all the muscles of the eye-ball ruptured, and the ball itself uninjured, but being connected by the optic nerve with its sheath and vessels, it was necessary to remove it, and I had an opportunity of examining the retina at once, which I did under the microscope. I need not say to any intelligent medical man that I did not do so with the slightest expectation of finding a picture of the falling tree, only anxious to sit for its portrait. Although no case could be more likely to exhibit, if such were possible, but nothing appeared but a slightly increased vascularity of the membrane, and in a day or two when mounted the vascular network might be supposed to resemble the branches of a tree by a person unacquainted with anatomy.—Wishing you all the compliments of the season, believe me to be, &c.,

W. D. Hemphill.

Clonmel, Dec. 28*th*, 1864.

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EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE ninth exhibition in connection with this society was opened to the public on the 20th ult. The two last years a competitive exhibition only, not challenging public attention, was held; but on the present occasion the society have resolved to call in the public to inspect the progress of the art. So far as the extent and excellence of the contributions are concerned, the resolve of the society appears to have been a wise one, and the exhibition ought to be a success. Very rarely has it happened that an exhibition of a similar kind has been so rich in the variety, excellence, and number of its contributions, the latter, according to the catalogue, reaching 671, one number frequently representing many pictures.

This exhibition is perhaps more thoroughly representative than any which has been held for some time, and in this respect presents a favourable contrast to that held in London last summer. The bulk of the contributions are, of course, by the wet collodion process, but the dry processes are by no means neglected. Of the nearly seven hundred contributions, over one hundred and sixty are by the various dry processes. Amongst these, the collodio-albumen process and its congeners take the most prominent position, both in excellence and numbers; there are not less than sixty-four contributions by the collodio-albumen process, twelve by the Fothergill process, and twelve by the hot-water process. The number of tannin contributions reaches thirty-seven, tannin and malt, nine, tannin and honey five. Waxed paper, which we had feared was almost obsolete, is well represented, the contributions numbering sixteen, the excellent secretary of the society, Mr. T. B. Johnstone, contributing some able pictures in this style. Malt is not largely represented, two contributions only appearing by that preservative, a somewhat remarkable circumstance, as Edinburgh was at one time the especial home of the malt process. Negatives from the prepared plates of Hill Norris have not supplied many prints, three only being noted as produced. Photographers generally feel the importance of preparing their own plates, especially when they intend the results for exhibition as their own production. There are also specimens of Camarsac's photo-enamelling process, the Wothlytype process, Pouncy's printing-ink process, photolithography, &c.

So much for the number and variety of the contributions. As regards excellence, it is, perhaps, judging the exhibition as a whole, second to the variety and extent. Nevertheless, barring a little excess of common-place card portraiture, the exhibition is a thoroughly good one, with some noble examples of the art. There is much beyond fine manipulation, for instance, in the beautiful landscapes of Mr. Annan, which are indicative of deep poetic feeling, and strong appreciation of the beautiful in the artist. The portraits by the same gentleman are also very fine, possessing rare softness and delicacy. The tender delicate gradations and atmospheric character of the pictures of Mr. Mudd win golden opinions from all observers. In portraiture perhaps nothing has ever exceeded in all real points of excellence, some of the contributions of Mr. H. P. Robinson. Here is a portrait, said to be that of the artist himself, which might be a magnificent reproduction of an old master. The sombre and massive effect without heaviness or blackness of accessories forming the interior of a study, the quaint effect of the tapestry, indefinite, yet sufficiently made out, which forms the chief part of the background, the fitness of the whole scene, the skilful management of the light, which streams from an unseen window towards the student, who sits all unconscious of the fact that Phœbus Apollo is securing the scene for his extensive portfolio,—all contribute to render this a specimen of the art of portraiture, of which photographers should be proud. "Brenda," by the same artist, is in the same manner, full of colour, although low in tone: it is the portrait of a charming girl engaged in reading; the picture is marked by a rich breadth of shadow, being singularly luminous, however, from the skilful distribution of very few lights; and distinguished by a remarkable absence of conventionality. A "Welsh Girl," and another portrait of a lady, also by Mr. Robinson, are very good. This gentleman has taken medals from the Scottish Society before for landscape and for groups: he appears here, we fancy, to have a design upon the award for portraiture.

Mr. Vernon Heath contributes some landscapes from Windsor, Frogmore, Sandringham, &c., of wonderful delicacy and beauty, and a striking picture and good photograph of "Indian Mastiffs," belonging to the Prince of Wales. The views of Osborne by Mr. Hughes place him at once amongst the very ablest dry plate men, and attest beyond doubt the value of his method of working the tannin process. The Swiss scenes of Mr. Stephen Thompson, and some views of Rouen Cathedral, are very delicate and perfect. Mr. W. D. Clark sends some collodio-albumen pictures, which are well intentioned, but just miss being good. "Nearing Home," by Bullock Brothers; a young lady with flowing drapery cleverly suspended in the clouds, is one of those things which we know are difficult, and wish were impossible. Photography is successful in delineating all that may be seen by human eye; but it fails essentially when it attempts imaginative art, and it is such attempts as these which expose it to the jeers of the older craft of painting. Mr. Rodger, of St. Andrews, is, as usual, very successful in portraiture; his pictures are all soft, round, forcible, and generally pleasing. Mr. Tunny has some very fine pictures, his groups being especially effective. Mr. Jeffrey contributes some fine portraits, quiet and natural, well-arranged, and full of tone. The Rev. D. T. K. Drummond has some fine landscapes by the tannin process. Mr. Good and Mr. Morgan also contribute good landscapes. Mrs. Cameron sends some remarkable portraits and symbolical embodiments of the cardinal virtues. This lady evidently possesses considerable artistic feeling, but we fear she is aiming to obtain from photography other results than those in which its strength lies. It would be little praise to the miniature painter to say that he secured on ivory the broad and suggestive effects, without detail, of the scene painter. There is a weird suggestiveness about Mrs. Cameron's pictures, and a skilful massing of lights and shadows that show considerable knowledge of art, scarcely well applied, however, in securing photographs in which almost all that constitutes the charm of a photograph, faultlessly minute detail and truth, are carefully eliminated. The Pantascopic Company send some of their wonderful panoramic pictures embracing over a 100 degrees, and very charming photographs to boot. Messrs. Window and Bridge send some of their pretty Diamond Cameo pictures, which are much admired.

Macfarlane, Horsburgh, Moffat, Dallas, Ewing, M. Whiting, and many others contribute pictures worthy of commendation did space permit. We miss with regret some of the names which have appeared in the Scottish Exhibition before, and have often graced others, we may mention those of Bedford, T. R. Williams, Blanchard, England, Rejlander, Joubert, Gresley, Swan, Thurston Thompson, and others, all of whose works shed a lustre on the art, and which we should have gladly seen displayed in the best exhibition yet held in the modern Athens.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

WOTHLYTYPE.—THE PHOTOGRAPHIC SOCIETY.—WHAT IS AN INVENTION?—ART CRITICS.—THE DUBLIN EXHIBITION.—THE EDINBURGH EXHIBITION.—CAMEO PORTRAITS.—MAGNESIUM LIGHT.—VALUE OF A PHOTOGRAPHER.—THE SOCIETIES.

I AM an old photographer, and have had much experience in formulæ and processes, and the modes of using them, and have some acquaintance with the ins and outs of the photographic art-world. Old age in art, as in life, is garrulous, perhaps tediously so, and I propose to bestow some of my tediousness on my brethren of the camera. I hope, from month, to month, in future, to have a chat with many friends in the pages of this journal, in which I shall venture to offer a few comments and suggestions on all subjects which photographers care to talk about.

The great topic of the month, indeed of the last three or four months, has been the Wothlytype, and very various are the different opinions thereon, "Very fine process, superb! nothing has been, nothing is, and nothing can be like it," exclaim a small and gradually diminishing flock of enthusiasts, with the least amount of tremor in their voices for fear they might be wrong. "A gigantic imposition, a silver process after all; its principle old, its permanency doubtful, its use improbable, and its patent invalid," cry, with no more truth, a much larger number of photographers; the great majority take the middle course, and while uncertain that it has many great advantages over the ordinary methods of printing, are willing to think there is something in it, and calmly wait the result of the experiments of such untiring and enthusiastic pioneers as Mr. H. Cooper, whose paper read before the London Society was certainly one of the most interesting events of the month, with the exception, perhaps, of Mr. Hughes' very practical and entertaining (a new feature in this line) paper on tannin, read at the same meeting, and in which he cleared away many of the delicate over-refinements, and worryings that so much impede the progress of otherwise good processes, and with which the tannin process has been more than usually smothered.

Speaking of the London Photographic Society, I am glad to say there appears a good prospect of its being regenerated. From some remarks of the chairman at the meeting, and a leader in the last number of the journal, it might be gathered that the necessity of something like a revival had come in upon the council, and the interest and number of the papers and objects brought before the meeting seemed to give some earnest of success. I heartily hope it may be so, although I cannot say I quite agreed with the energy with which Mr. Glaisher snatched at the papers the moment after they had been read, as though he feared violent hands would be laid on them, lest they should appear in other journals before they had appeared in that of the Society. However, many things, even a little apparent rudeness, might be excused in a good cause. For all this I cannot help thinking that it would be better for the society to try to raise its own journal rather than endeavour to retard the progress of others —

> "Our remedies oft in ourselves do lie,
> Which we ascribe to Heaven: the fated sky
> Gives us free scope; only, doth backwards pull
> Our slow designs, when we ourselves are dull."

What is an invention? Is a modification an invention, and is the modificator an inventor? if so, how full of inventive genius is the photographic profession! Novelty now is nothing new. We all know what splendid reputations were made out of honey modifications for dry processes. How, beginning with Spiller and Crookes' deliquescent salts, it ran through honey, oxymel, glycerine, and syrups of every kind, each with twenty modifications at least, until the climax of infatuation was reached, and photographers began to throw away their beer over their plates, when the teetotal reaction set in, and hot water became popular. But this is getting away from the subject—What is an invention? because several things with that name have been shown at meetings during the month. Perhaps the most extraordinary attempt to obtain a patent, and wonderful to say, an unsuccessful one, for patent agents take money when it is offered to them, was one applied for during the last year for a photographic album, the margin of which was to be devoted to advertisements. Fancy a graceful portrait of a lady whose flowing drapery falls in faultless folds, surrounded by a description of the sans-flectum crinoline, or a youth with hyacinthine locks, in the midst of an announcement of the gentleman's real head of hair. The Patent Commissioners in this instance, with a rare prudence, refused the "invention" the protection of letters patent.

We have had the usual crop of art-critics talking nonsense about photography, of which they seem to understand rather less than usual. They talk roundly, and make their sentences sound well, which is something, but scarcely an equivalent for a knowledge of their subject. It is a thing to be grateful for that the public are beginning to understand their emptiness. It is true that some of them have caught a few of the phrases properly belonging to photographic criticism, as some of our photographic art-writers have picked up the jargon of art, and are thus enabled to talk learnedly on what they don't understand, but we are reminded by Hood that:—

> "'Tis not so plain as the old Hill of Howth,
> A man has got his belly full of meat
> Because he talks with victuals in his mouth!"

Photography was born great, in its youth it achieved greatness, and now it has greatness thrust upon it. Thanks to Sir Joscelyn Coghill, photographs will be exhibited at the Dublin International Exhibition, by the side of, and will rank with, paintings and drawings. And all this distinction will not rob photographers of their reward in the shape of medals. There should be joy in glass-houses at this little incident in the life of the art, and now it is for photographers, by the perfection of the pictures they exhibit, to save the managers of the Exhibition from being the victims of mis-placed confidence. I am glad to hear that nearly all of our best photographers are preparing for the competition.

Do the people of Edinburgh appreciate our art better than the people of London? Or do they manage things better in the north? The Exhibition of the Photographic Society of Scotland seems to be in every way a success, while that of London has died of atrophy. Names, and good ones too, absent from the last London catalogue, are sprinkled plentifully over that of Scotland. Why should this be?

Besides the threatened revolution in printing, which the Wothlytype will probably bring about, by directing inquiring minds to the subject, although it will not do it itself, we are to have another. Card portraits, which have brought fortunes to some, competence to many, and good to all; which have taught photographers how to arrange a figure, —that is, all who had capacity to learn—and painters how to paint, are doomed! and cameo portraits are to take their places. Now, although I admire the cameos, and see a good deal of beauty in them, I am sorry for this. I think there can be little doubt but that a good carte de visite is the best and most perfect form of portrait, bar its diminutiveness, that photography has yet produced; it has pleased the public, it has pleased the photographers, and has been in every sense of the word a success, and it is to be hoped that photographers will not be too hasty in banishing entirely an old friend for a new one. The difference between the two styles is very great; the *carte* gives scope for every variation of arrangement of which a portrait is capable; but it demands a capable photographer to illustrate its excellence. The *incapable*, it is true, may make a mess of the cameo, providing that his incapability be of a very elaborate and comprehensive character; but the new style will make less demand upon his knowledge or taste, and will afford him less scope and facility for perpetrating the hideous travesties of pictorial arrangement we have seen in some card pictures. Properly speaking, there is no need to regard the full length card and the cameo bust as in any degree pitted against each other; indeed, it will often be the fault of a photographer with a connection if his customers don't have portraits in both styles.

The magnesium light has shone with great brilliancy during the dark days of December. The *Standard* had a leading article thereon, promising all sorts of impossible wonders from its use, and printed a letter from Mr. A. G.

Grant on the subject, verbatim, which it styled a literary curiosity. Several letters have also been written on the subject by Mr. A. Brothers and others.

In a case tried before the Lord Mayor's Court—Nottage *v.* Green—it was proved that the photographic labourer was worthy of his hire, that is to say, five guineas a-day. At which the profession must rejoice. Mr. King James, the defendant's counsel, would have brought what he termed, "a most respectable witness from Regent Street," to prove the charge was too much, but he had gone out of town. Do you feel flattered, brethren, there was not one respectable photographer left, no, not one!

The societies have exhibited average activity during the past month. In addition to the papers we have mentioned, by Mr. Cooper and Mr. Hughes, at the London Society, there was a paper read on "Micro-Photography" by Dr. Maddox, illustrated by admirable examples, exhibited by aid of the magic lantern, by Mr. How, as well as a residue reducing apparatus by Mr. Hart, a tent by Mr. Thomas, and some most excellent copies of engineers' drawings produced by a new and patent process by Mr. Willis, of Birmingham, exhibited by Mr. Peter le Neve Foster. At the South London Society, Mr. Window read a paper on "Cameo Portraits," illustrated with the necessary apparatus, and Mr. A. G. Grant gave his experience in fuming with ammonia. At the North London, Mr. W. Warwick King read a very able paper on "Neglected Art-fields for Photographers," in which, after showing that it was not absolutely necessary for the welfare of photography that every man who owns a camera should photograph Kenilworth Castle and Tintern Abbey, he pointed out many ways in which photographers might employ themselves with profit to themselves and to the satisfaction of their patrons. Mr. Warner exhibited a camera stand which would do everything that was required of it; and Messrs. Helsby and Co., of Liverpool, exhibited some charming examples of—I must turn to the word before I quote it—Helioaristotypia! The provincial societies have been rather dull. At Manchester, Mr. Petschler read a paper on the "Collodio-albumen or Taupenot Process;" this appears to be the chronic topic at the Manchester Society. The Edinburgh Photographic Society had a magic lantern exhibition of Dr. Maddox's micro-photographs. The Chorlton and Bradford Societies were inaudible, and the Photographic Society of Scotland had a "dress" private view previous to the opening of their exhibition to the public; perhaps the most pleasant "meeting" of the month.

PHOTOGRAPHS OF PHOTOGRAPHERS.

BY JOHN E. CUSSANS.*

YES, photographers, your turn has come at last. For twenty years you have been practising your art upon others, you must now submit to the operation yourselves. A member of the Spanish Inquisition or *das Vehmgericht* might not possibly be willing to undergo the same ordeal in his own person that he was in the daily habit of prescribing for his victims, nevertheless, the tables were occasionally turned, and he who was wont to officiate as interlocutor or judge, was sometimes forced to take a seat himself *dans la siege de nôtre dâme.*

Without further preamble, I shall now adjust my apparatus, and prepare forthwith to take a few photographs of certain representative operators of my acquaintance. I will take every gentleman singly, and in his own studio, as that will serve for a good background, and tend materially to give additional truth and vigour to the picture.

Here's the first.—This gentleman is a good chemist and photographer; keeps himself well posted in the current photographic literature of the day; is a member of half a dozen societies; can descant fluently, and withal sensibly on the merits of almost every new process; and has been even known on certain occasions to hint at the probability of his shortly producing photographs in their natural colours. I find his reception-room appropriately furnished, and on the walls and tables some first-class specimens. His glass-room, too, is large and cheerful. A minute's conversation with him suffices to show that he is a gentleman, and yet somehow he doesn't get on. How is it? Want of application to business? No, you will find him busy at nine o'clock in the morning, and he does not knock off while there is a chance of working. Roughness of demeanour? Not at all; a more agreeable and affable man it would be hard to find. Here's the secret. He is too fond of experimenting, and lacks fixity of purpose. Some time ago he bought a solar camera for enlargements, and after a week's trial he found that the traffic in the street caused so much vibration that the copies were hopelessly blurred. Since that time it has been laid aside, to keep company with an elaborate contrivance which he devised for coating large plates, and a number of other equally ingenious but useless inventions. His lumber-room contains enough specimens of machinery to furnish the museum of a Mechanics' Institute. The natural consequence of all this waste of time and money, is, that in making up his books he discovers that his expenses nearly equal his receipts. But, it may be urged, you would'nt have a man, Chinese-like, persist in following a beaten track, because it was at one time the best. By no means. It is undoubtedly the duty of every one to keep pace with the times. The photographer who reads no journal, and is ignorant of all that is transpiring around him, is not likely to make much mark in his profession; but as long as he practises photography *for a living*, he should leave experimentalizing more to amateurs, and not blindly chase every will-o'the-wisp that presents itself. When any new process is conclusively shown to possess advantages over that which he is now using, let him by all means adopt it; but until then, he should be content to follow that which he knows yields profitable results.

The next gentleman I call on, differs essentially from the last. A single remark which I hear him make to a lady who is dissatisfied with her portrait, sufficiently indicates his character. "Well, I call it a good picture, and if you don't like it, it is not my fault." The lady retires, and, in all probability, will never call on my brusque friend again. His personal appearance is certainly not prepossessing. This is Thursday, clean shirt day, as we called it at school, but it is evident that the one he has on now is the same in which he ate his Sunday's dinner; the sleeves, curiously stained with silver and developer, are rolled back to his elbows, just far enough to disclose his grey jersey. This is not an agreeable portrait to contemplate, let us pass on to the next.

This gentleman ought to be classified amongst the genus "swell." His limbs are swathed in a loose robe of gorgeous design, beneath the folds of which are to be seen red morocco slippers; on his head he bears an embroidered fez, and what little of his linen is visible, is unexceptionable. I find him on my entrance giving directions to two men who are painting a scenic background. His *atelier*, (*studio* is not sufficiently refined for him,) is covered with a Turkey carpet, and there is no lack of elaborate properties around. Was it Reubens or Van Dyke who would never paint except in full dress? *N'importe.* Possibly this gentleman imagines that by aping the eccentricities of genius, the public will be impressed with an exalted idea of his importance, and indirectly, of his skill. All this, I fancy, savours of charlatanism, which in the long run is pretty sure to come to grief.

In the next establishment I visit, I find the young lady who officiates in the reception-room, laughing and chatting with a gentleman who is lolling on her table and smoking a cigar. Both look up as I enter the room, but their conversation is immediately resumed. I am kept waiting for perhaps a minute, while they are discussing the relative superiority of frangipani and patchouli. Unwilling to disturb them, I pass unquestioned upstairs. "Is Mr.—— here," I ask of a boy of about sixteen, who presents himself. "No sir," is the prompt reply, "but if you want your card taken, I can do it." I thank him, but decline his proffered services; meanwhile, I take a glance round the room. I remark a large and unseemly yellow stain on the blind over head, occasioned by the rain dropping upon it, which defect in the roof, two minutes and a small piece of putty, dextrously applied, would effectually remedy. At least two days' dust is lying on the furniture. A copy of *Sporting Life*, is on the table; by the side of which is a velvet covered chair with the gimp hanging in irregular festoons around it; and though partially concealed by the focussing cloth, I see a pewter pot on the floor. On repassing the door of the reception room, I hear that the question of perfumes is still undecided. I am sorry that I cannot give a photograph of the proprietor himself, but in his absence I have attempted a picture of his establishment.

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* Author of "Those who live in Glass Houses," &c., in Dickens's "All the Year Round."

Proceeding onwards in my photographic tour, I call upon another artist. He enjoys a high reputation for skill, and deservedly so, but unfortunately does not possess that most difficult of all things to acquire, the art of making himself agreeable. A lady suggests that her child, who is being taken, should turn his face the other way. Without deigning to reply he waives her to a seat in the most courteously discourteous manner possible. A gentleman wishes to be exhibited to his friends in a posture which our photographer rightly judges to be unbecoming. "Excuse me, sir, but are you, or am I the artist?" is the amiable enquiry. Thus politely snubbed, the gentleman certainly makes no further suggestions, but a single glance at the finished proofs sufficiently indicates what was passing in his mind at the time.

The light is going rapidly, and I will only have time to take another photograph. Here it is. I find the entrance to this establishment clean and spacious, the stairs are neatly covered with oil-cloth, and all the appointments and furniture in the reception and dressing rooms are in good taste and in perfect order. The glass room is not cumbered with a quantity of useless properties, everything is clean and sightly. The artist is thoroughly acquainted with every detail of his profession. He used formerly to pay ten or twelve shillings to have his background distempered, but, now he does it himself when necessary, at a cost of sixpence, and can deftly effect little repairs without calling in the assistance of a carpenter or cabinet maker. He takes the News regularly, and pays for it in advance. He reads the *Times*, or *Telegraph* every morning at breakfast, so that he is never at a loss for a subject wherewith to entertain his sitters whilst posing, or waiting for the plate, and knows no end of original and thrilling nursery romances to tell children. He never offends his sitters by an uncourteous answer or remark: listens patiently to their suggestions, and, if practicable, adopts them; but if not, then by gentleness, happily blended with firmness, he always manages to have his own way. Should any person present himself who exhibits signs of a cantankerous, or overbearing disposition, he treats him with *civility*, but not with *servility*, and never under any circumstances loses his temper, at least not in the glass-room; he may perhaps. find it absolutely necessary sometimes to ease his mind by retiring to the dark room, and letting off a few mild expletives for the benefit of his coater or developer. He does not bore his sitters by trying to induce them to have coloured enlargements against their inclination, in the obtrusive manner of hairdressers vaunting the excellence of their Columbian balm.

Perhaps some of the photographs I have exhibited may not be quite in focus; they may be fogged, and possibly somewhat distorted or hard, and wanting in detail; but let me ask you, O impartial photographic reader, are all *your* January pictures, clear, sharp, soft, brilliant, vigorous, and full of life, to quote the stereotyped phrase of the fine-art reporter of one of the principal dailies, when favourably noticing a photograph. Moreover, have you never during the course of your experience, when you have obtained what you fondly consider to be a good likeness, had the same contemptuously refused by your client (*client* sounds better than *customer*, and means the same thing) as bad? Did a person never say to you as a lady did to me a short time ago—"If I thought I was as ugly as that, I would shut myself up in a dark closet, and never show myself again"?—perhaps not in the same words; but have you not heard in equally strong terms, the idea repudiated of there being any resemblance between the original and the photographic transcript, while at the same time you have been mentally exclaiming "'Tis nature pictured too severely true"?

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CLEAN HANDS AND CLEAN PICTURES.

BY W. G. TWEEDY.

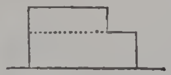
Doctor. Look how she rubs her hands.

Gentleman. It is an accustomed action with her to seem thus washing her hands: I have known her continue in this a quarter of an hour.

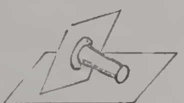
Lady Macbeth. Yet here's a spot. * * * Out, damned spot, out I say. One; two; why, then, 'tis time to do't. * * * What, will these hands ne'er be clean? No more of that, my lord: no more of that, you mar all with this starting.—Macbeth. V. 1.

A Shakespearian friend of mine, whose wife practises photography, says he is convinced, by the above passages, that Lady Macbeth was a worker in that black art; that the hand-rubbings, the complaints about spots (not to mention the bad language), the counting—one—two—of the exposure, and the caution to her husband about moving during the sitting, all harmonize so well with this hypothesis, that he intends some day, when he has completed his researches, to publish a volume to prove that Shakespeare was as great an adept in photography, as he was in divinity and law.

Undoubtedly the difficulty of keeping their dainty fingers stainless, is the great reason why we have comparatively so few lady amateurs; people have got to look upon black fingers as a necessity, and so perhaps they are when the old system of exciting the film is pursued. Some time ago, I devised an arrangement for my own use, which is simple, efficacious, and absolutely stainless, besides being possessed of many minor advantages. In place of the usual dipping bath, I employ a glass dish, an inch or so larger each way than my plates, and half an inch deep. On the bottom of this, near one side, is cemented a strip of plate glass, $\frac{1}{4}$-inch thick and $\frac{1}{2}$-inch wide, and on top of this another strip, $\frac{3}{8}$-inch wide, is cemented, so as to form a rebate. A similar rebate is made for the opposite side of the dish, but is not cemented down to the bottom, so that it can be placed at any distance from the first, to suit plates of different sizes.



The dish is placed on a level shelf, and filled $\frac{1}{4}$-inch deep with bath solution, the plate is attached to a pneumatic holder, coated, the edge placed on the ledge of the fixed rebate, and quickly lowered, face downwards, on to the solution, the opposite edge of the plate resting on the ledge of the moveable rebate, which has been previously placed at the right distance to receive it. There is no danger of streaks or air-bubbles, if the dish is properly levelled and filled; and the edges and back of the plate are not wetted by the solution. When the film is ready, the plate is lifted by the pneumatic holder into an upright position, the holder acting as a support behind, and the lower edge of the plate resting on the ledge of the rebate, until it has drained enough, and it is then rested in the same position on blotting paper for a few seconds, and then placed in the shield,* the holder being removed only when the plate is resting on the silver corners of the carrier.



After exposure, the back of the shield is opened, the holder attached, and the development conducted in the usual way. In this manner the plate is never touched by the hand until the holder is removed after the final washing from the hypo, which is contained in a dish like the bath, and the surface only of the plate applied to it in the same way.

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* I think this Americanism worthy of adoption, in place of "camera-back."

A close-fitting cover excludes dust and prevents the evaporation of the bath when not in use; the quantity of bath solution is only one-third that of the old system, a few drops of solution added from time to time keeps up the level; there is no mess and waste of solution by drainings in the shield, the bath does not become charged with ether and alcohol, as these readily evaporate from its ample surface, and it acquires no organic matter from dirty glasses, as the collodion only comes in contact with it. For professional work, especially, I am convinced that the advantages of this system are so great that it only requires to be known to be adopted.

I find great advantage in developing my dry plates in a similar way. I have frequently found that dry plates were spoiled by first wetting them with water, when they would otherwise have given good negatives. In all cases the wetting previous to applying the developer makes the development very much slower. I now attach my holder to the back of the dry plate, and place it, face downwards, on the pyro-alkaline solution; the image comes out very rapidly: it is then washed under the tap, and intensified with pyro and silver, while another plate is being developed in the dish. I find that almost any kind of dry plate can be developed successfully by pyro and alkali in this way, which is not the case when the plates are first wetted with water; even plain washed collodion produces splendid negatives, if a few drops of a four-grain solution of gelatine is added to the pyro and alkali, and at least a dozen plates may be developed on the same solution, without its giving any sign of exhaustion.

I may on a future occasion give the results of my experience as a dry-plate worker with various processes, and my system of preparation by which the trouble is reduced to a minimum; but I fancy I hear the Editor grumbling at the length to which this has run already, and so rein in my hobby-horse, and wish all my fellow workers, a Happy New Year.

Plymouth.

PHOTO-SCULPTURE.

[We have much pleasure in calling the attention of our readers to the following able article from the *Times*, especially for the handsome recognition it makes of the valuable influence exercised by photographers upon art.—Ed.]

When Professor Wheatstone invented the stereoscope, and, as far as vision was concerned, gave roundness and solidity to photographic pictures imprinted on flat surfaces, the effect was so wonderfully lifelike that we could not help regretting that what we saw was only an illusion of the sense, and that we could not transfer the rounded forms impressed upon our retinæ to some durable and tangible material. The regret of yesterday has, however, become the fact of to-day, and photography, among its many gifts to the Arts, has lately invaded the studio of the sculptor, and put into his hands the means of transferring its images directly to his modelling clay, and of impressing upon it the subtle truth and fleeting beauty which the pencil of light is alone capable of fixing upon the delicate silver tablet. Those of our readers who are in the habit of attending scientific meetings, cannot but have remarked the very beautiful statuettes, busts, and medallions, produced by photo-sculpture, which have been exhibited within these last few months at such meetings. Without being aware of the process by which they had been produced, the character and lifelike expression of these pieces of sculpture must have struck the visitor. They brought to mind not so much the modeller as the stereoscopic images. The movements, the floating actions, and expressions seemed by some process to have been caught and fixed in an instant, like flies in amber. The tale told by the photographic lens was written upon them. What we felt instinctively, on examination turned out to be the real truth. These statuettes were the indirect productions of the pencil of light. The graceful and living folds were wrought not by the imperfect chisel of the artist, but by Sol himself. To those who have not witnessed the process by which the photographic art is made subsidiary to that of sculpture, the whole thing seems inexplicable. In reality, however, it is simple enough.

The process is the invention of M. Willéme, a French sculptor, and was brought before the world by him some two years since. At first his scheme was ridiculed as one of the many abortive ideas photography has given rise to, but there was real vitality in it, and it has been reduced to a working fact, a company having been formed in Paris for the production of works of art, which is now in full operation, and, as a similar company is now being established in London, we may see the new art in active operation at M. Claudet's studio in Regent Street. The first step in the process is a photographic one. The chamber fitted up in Paris for this purpose is circular, having in the centre a raised, round platform, divided into twenty-four equal segments, on which the sitter is posed. Around the room commanding each its own segment, twenty four cameras are placed, so directed as to take vertical sections of the sitter, the whole number giving a complete picture of his figure and features. This battery of cameras is opened upon him simultaneously, and in a moment the expression of his whole body as he stands or sits is transferred in twenty-four segments to the photographic paper. This is all the sitter has to do; his patience is taxed no longer than it is in taking an ordinary carte de visite, and that is time enough to afford the sculptor all the data he requires transferred to his modelling clay. The celerity with which this part of the process is performed is very important. The tedious method by which the sculptor proceeded of old to take the likeness for his model, the disturbance caused by the shifting of his position, the necesssty for making plaster casts of his face, all of which steps, often repeated, took much time, and caused much fatigue, are wholly avoided by the new art. M. Berryer, on his late flying visit to this country, was invited by M. Claudet to sit for his statuette. Half an hour's visit to the studio was sufficient for the artist's purpose, and the distinguished advocate will know nothing more of the matter until he sees a perfect image of himself in the shop windows. To take up the process, however, at the point at which we left off. The twenty-four cartes de visite are too small for the purposes of the statuary, and they have to be increased. This is done by means of the solar camera, which throws a sufficient enlargement on stout drawing paper, and on this the artist with a pencil carefully follows all the outlines and delicate details it is requisite to note. These working drawings place the sculptor in possession of all the leading outlines of his sitter's form and features. His object now is to impress them upon the modelling clay. This is done by means of the well-known instrument, the pantograph, or copying machine. The outline sketches are suspended upon a board and while an assistant follows the lines with the tracer, the motion is conveyed with mathematical accuracy to the style or knife which the artist or his assistant directs, while it cuts the photographic outlines upon the lump of soft clay which is placed upon a revolving disc, divided, like the vertical sections of the sitter, into twenty-four segments. The artist by this means can in a moment refer to the enlarged *carte* of the section he wishes to cut. It is quite startling to watch the rapidity with which the shapeless lump of clay is transferred as it were into a living figure. Four vertical sections, say figures 6, 12, 18, and 24 representing the four angles, which the cutter makes as rapidly as the pencil follows the outline of the drawings, are quite sufficient to give a rough sketch of the figure on the clay that is at once recognizable by any friend of the sitter. When all the twenty-four outlines have been tranferred to the clay, and the more delicate details on the flat have been indicated, the mechanical part of the process is complete, and the artist takes up and perfects the work. Of course, upon his skill the final finish and delicacy of the statuette depends. It is not pretended that the mechanical process we have described can make a perfect statuette instinct with life and feeling. All it assumes to do is to give the modeller perfectly faithful outlines of nature; his mind or fancy must finally build upon this foundation, and put Promethean fire into the work. Copies are taken, of course, in the ordinary manner, the new process only taking the place of the modeller's hand in giving form to the clay. We do not suppose that statuettes produced in this manner will ever become as popular as the carte de visite, as their cost will put them beyond the reach of the masses. Small busts are, however, sold in Paris as low as a guinea each, and doubtless, the prices will fall with increased facility of production, which is certain to follow upon an increased demand for them.

Photography has undoubtedly influenced the painter's art, and will continue to do so. In face of the training it has given the public eye in delicate drawing and truth of detail, slovenly work will no longer be tolerated. It has, in fact, utterly routed the whole class of second-rate miniature painters, while the Richmonds and the Thorbourns of the art are only too glad to correct their own pencils by that of the sunlight. The sculptor will also learn a lesson from the teaching of the camera; he may see that he does not lose breadth of effect by following nature into her remotest details, and that he gives life to his figures by adopting them, which he cannot attain by the generalizing method he has lately been in the habit of adopting. There has scarcely been a public statue erected in the metropolis within these last fifty years, which is not a disgrace to the art. A style of generalized dress has been adopted, in order to avoid the ordinary costume of the day—a style which completely destroys the personality of the individual it is intended to represent. George IV. rides in Trafalgar Square in his drawers, like an equestrian at Astley's, Sir Robert Peel stands in Cheapside in a sentimental attitude in tight-fitting pantaloons — a style which is being repeated all over the country. There may be some objections to the naturalistic aspect of art, but if we are to have statues as remembrances of the departed great the likeness should not be confined, as at present, to the countenance. A man is known as much by his figure and even by his ordinary dress as by his visage. Every one knew the Emperor on the top of the column in the Place Vendome, in his cocked hat and redingote, but we very much question if the statue draped in the Imperial robes which now replaces it will convey any of the inspiration of the old familiar figure. If our sculptors dress statues as the men dressed themselves, they must do it honestly and faithfully, and then the costume will neither be insipid nor vulgar. The new art of photo-sculpture will enable the artist to do this with exact truth; the very folds of a coat—and how much character there may be expressed even in these petty details! — can be copied with the utmost fidelity, and the sculptor may, without derogating from the dignity of his art, follow these indications with the greatest advantage. Many precious works of art, too, which could not hitherto be multiplied, in consequence of the disinclination of their owners to submit them to the perils of cast-taking, may now be given to the public without fear, as copies may be taken without touching the originals; indeed, the uses to which photo-sculpture may be put are so numerous that we anticipate for it a very foremost place among the scientific appliances of the age.

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Proceedings of Societies.

London Photographic Society.

The usual monthly meeting was held at King's College, on the evening of Tuesday, January 3rd. Mr. Glaisher, F.R.S., &c., in the chair.

In the absence from home of Dr. Diamond, Dr. Wright undertook the duties of Secretary. The minutes of a preceding meeting having been read and confirmed, Mr. Maurice Griffith Williams was proposed and elected a member of the society.

On the motion of Mr. Mayall, seconded by Mr. Johnson, Messrs. Heisch and H. Claudet were elected auditors for the year's accounts.

After a few words from the Chairman, stating that the weather had not permitted the continuance of Mr. Cooper's experiments in uranium printing, so as to enable him to bring the matter before them again at present.

Mr. Haes read an interesting paper describing his experiences in photographing the animals at the Zoological Gardens in which he gave an amusing account of the ruses which had to be adopted, and the patience required, in securing this novel series of portraits. He had commenced his operations with an ordinary stereo lens; but soon found from the restlessness of the animals that something more rapid would be required. He consulted with Mr. Dallmeyer, who recommended him a long focus No. 1 B, made by that gentleman, which he had in his possession. All the stereo pictures had been so produced, and the larger ones, on 7 by 7 plates, with the No. 2 B. of the same maker. He used a Smartt's tent and Rouch's bromo-iodized collodion, with 30-grain silver bath, and 20-grain iron solution, intensifying with pyro and citric acid. All the exposures were necessarily very short, averaging about one-third of a second, the lens being uncovered with Dallmeyer's flap shutter. He had obtained fifty-five subjects, a very great number of exposures being made, which were not successful from the movement of the animals. Mr. Haes exhibited a number of the results he had obtained, both in stereoscopic slides and larger pictures on paper, which obtained general commendation. At the conclusion of the paper, Mr. Highley exhibited, by the aid of the magic lantern and oxyhydrogen light, a number of transparencies obtained from Mr. Haes' negatives, which had been, as Mr. Haes explained, only 24 hours in Mr. Highley's possesion, and were necessarily hastily produced. The results were very fine, and elicited general admiration.

The Chairman expressed his great delight with the pictures, and his high opinion of their educational and scientific value. Mr. Haes had already, he understood, gained royal approval of his work, and every one must agree that he had done essentially useful and valuable work. All the pictures were good and instructive, but he especially admired those of the tiger, the cheetah, the wolf, the seal, the zebra, the dromedary, the sable antelope, and the eland. He hoped Mr. Haes would continue his labours, and complete the series. He had pleasure in moving a vote of thanks.

Mr. Mayall, in seconding the vote of thanks, recalled to memory the excellent results obtained by the Count de Montizor in the same Gardens.

After a few more words from the Chairman, the thanks were carried by acclamation.

The Chairman then read a letter from Mr. How, calling attention to a retort, which he forwarded for inspection, by which the danger arising from explosions in the manufacture of oxygen gas was obviated.

Mr. Sebastian Davis explained that the allusion was made to a recent explosion at Manchester, arising it was supposed from some admixture to the manganese by which hydrogen had been generated, forming the well-known explosive compound.

Mr. Mayall thought the retort would not be efficient. If the explosion took place, the top would be blown off, and act like a bullet. It was moreover much too small for practical purposes.

Mr. Highley had had much experience in the manufacture of oxygen, and might call attention to one or two points of importance. It was customary to mix the chlorate of potash, with very finely powdered manganese, which, when any disturbance or ebullition took place in the retort, readily blew over and clogged the pipes, after which an explosion would necessarily follow. Both himself and some other gentlemen he knew, had had explosions from this cause. The remedy was to use the manganese in coarse grains instead of powder. This answered as well, did not produce the danger to which he had referred, and was less liable to contamination or adulteration. In the retort he used, there was a wide pipe to which was attached a piece of india-rubber tube, which formed the connection with the rest of the apparatus, this was easily blown off and formed a safety valve in case of explosion. Manganese was a cheap and rough material, shovelled carelessly about, so that even if a portion were analysed and found pure, it was no proof that the whole would be free from foreign matter.

Mr. Mayall said that an impression seemed to prevail amongst some that great heat was necessary to decompose the chlorate of potash, in order to produce oxygen. A piece of gas pipe bent round giving a few jets would produce sufficient heat, if a thin wrought-iron retort were used. To this might be attached a flexible tube, strong enough for ordinary pressure, but not too strong to prevent the gas getting at liberty, if a dangerous explosion were imminent. The granular manganese was doubtless better than that in powder. Regarding the retort before them, he did not know whether due consideration had been given to the expansive character of the two metals, if it happened that the iron expanded most rapidly, the top would become fixed by that means.

Mr. Highley, in agreeing with Mr. Mayall as to the use of gas for heating the retort, said, when the gas was found to be coming over too fast, the gas could be quickly turned down, and the heat reduced much more readily than when a fire was employed.

The Chairman said that members were much indebted to the gentlemen who had just given them the results of practical experience, which was always valuable. He then called attention to some examples of Helsby's miniatures on opal glass. No details of the method of producing them were given, but the process was said to be new; if so, Messrs. Helsby could not do better than describe it at a future meeting.

Mr. Johnson then exhibited and explained the pantascopic camera, and called attention to a number of the beautiful pictures by the camera, embracing 120°, which were laid on the table.

The Chairman said that 120° was a greater angle than he could see with the human eye.

Mr. Johnson said of course, if the head were not turned; but in examining anything in panoramic perspective, the head must be turned.

After some further conversation,

Mr. Cole said he would be sorry to say anything in disparagement of such charming specimens as those on the table. At the same time it must not be forgotten that they required truth, and these pictures were not truthful. They reminded him of a celebrated view of Venice, by Holland, in which the Grand Canal, comparatively speaking, only a few yards wide, was made to look like a sea. He as an architect felt bound to protest against anything which detracted from the dignity of architecture, and here he saw noble buildings dwarfed into insignificance, as an especial illustration of which he might mention the view of the river and Houses of Parliament, the highest tower of which was 400 feet high, and yet here looked as nothing compared to the breadth of the river.

Mr. Johnson thought that this was rather a reproach to photography than to his camera. If several views of the subject were taken with the same lens, and placed side by side, they would give a picture of precisely the same proportions. Of course the rules of plain perspective could not be applied to a panoramic projection.

Mr. Cole would not represent either nature or art in panoramic perspective; but in plain perspective, which would give exactly its own dignity to each object represented, and be accordant with truth.

Mr. Mayall referred to M. Martin's panoramic camera, made twenty years ago, to work on curved plates, and to Mr. Sutton's camera, brought out a few years ago, in which the camera was curved, the plates curved, all the lines curved, in fact, everything curved. He objected to that; but he did not see much force in Mr. Cole's objection. The unreal representation of magnitude was due to the use of a lens of short focus. He was reminded of the old couplet:—

"Why has not man a microscopic eye?
Just for this reason—man is not a fly."

The great reproach to photography had been that the view never included enough to make a picture. This reproach the score of artistic qualities was got over, and they were met with the reproach that the results were not true. Art was simply nature in its best form. Perhaps a picture in nature, or the combination of effects, which would produce it, only existed for a moment; but the artistic eye—which was but a camera—saw that picture, retained and perpetuated it. The artist never dreamed of confining his picture to what he saw from one point without turning his head. These pictures reminded him more of the paintings of Turner than anything he had ever seen; and were in fact the only photographic landscapes he had seen; he had ever had a desire to possess. After some further remarks, Mr. Mayall asked how many pictures a day could be produced by this camera, and received answer that about a quarter of an hour was required for one.

Mr. Allen made some remarks on the distortion produced by all lenses, when used for objects within a few yards, and others some miles distant at the same time.

The Chairman said this being fixed for a mean distance, the error was equally distributed. He was glad to see a camera like this, as it decidedly indicated progress in the art; and the pictures were, he thought, very beautiful.

Mr. Peter Le Neve Foster thought there could be but one opinion as to the mechanical ingenuity displayed in the camera. But the question of plain perspective and panoramic perspective required a fuller discussion before the question could be settled. Such a discussion would be a most interesting one, and would involve important mathematical principles.

Mr. Johnson thought that pictorial representation could not be literally confined to plain perspective. His pictures were, when properly examined, rigidly correct, and might be used for the purposes of topographical survey.

Some further conversation ensued, and a hope expressed that the subject would be brought forward again.

Mr. Cooper explained in reference to the announcement of his paper, that he had really made no promise; but seeing it announced, he should, had not indisposition and bad weather intervened, have endeavoured to provide one. He thought he might venture to promise one for the March meeting.

After some further remarks, the proceedings terminated.

We cannot close this report without expressing our satisfaction at the improved arrangement of the room, the increased amount of light, and the generally augmented feeling of comfort and interest prevailing in the meeting.

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Correspondence.

SALTS OF URANIUM.

My dear Sir,—With reference to Mr. Price's letter in your impresssion of December 23rd, 1864; a little explanation is necessary.

In the first place; the printers, both for your paper and for the *British Journal*, have omitted the inverted commas in the first part of the foot-note appended to my paper at page 606 of the News.

The sentence—"When caustic alkali is added to a solution of nitrate of sesqui-oxide of uranium ($U_2\,O_3,\,NO_5 + 6\,HO$) a yellow precipitate of hydrated oxide falls, which retains, however, a portion of the precipitant," is quoted from "Fowne's Manual," p. 351.

When I am in error nothing gives me greater pleasure than to be set right, and I am much obliged to Mr. Price for again calling my attention to the subject of the uranic oxides.

I must state that my paper "On Printing with the Salts of Uranium" was written and read before I had consulted any manual of chemistry on the subject; my supposition that I had obtained an oxide of uranium by the means there stated, being derived entirely from my own ideas and experiments. The mistake in the second portion of the foot-note occurred through a mis-understanding between Mr. Williams and myself. I need not remind Mr. Price of the difficulties that surround the question of uranium and its oxides, nor of the varying opinions of different authorities; and I am sure he will readily understand how a novice in chemistry may fall into an error on first examining the subject. I was much surprised to find that Hoffman made no mention of the statement of Mr. Williams, that the precipitate I obtained was uranate of ammonia. He only says that one of the characteristics of the uranium salts, is "a yellow precipitate with caustic alkalies, convertible by heat into black oxide." In a subsequent interview with Mr. Williams he recapitulated what he said at the meeting. I then wrote the foot-note and submitted it for his approval, and I understood him to say that the ordinary nitrate of uranium was a nitrate of a higher oxide than the one named by Hoffman, the sesquioxide (U_2O_3), and that my statement was correct. I need hardly say that the mistake which arose was mine. Within the last few days Mr. Williams has most kindly gone through the whole subject with me, and shown me the opinions of several chemists.

The foot-note should have said that Hoffman, the writer of "Fowne's Manual," says, at page 351, that "when caustic alkali is added to a solution of sesquioxide of uranium ($U_2O_3, NO_5 + 6HO$) a yellow precipitate of hydrated oxide falls;" but that other chemists call the same oxide (U_2O_3) the peroxide, which seems to be the better term, as its salts have very few, if any, of the characteristics of sesqui-salts; or an oxide of uranyl $(U_2O_2)\,O$; and say that when caustic alkali is added to a solution of the nitrate of this per- or sesqui-oxide, a uranate of the alkali is thrown down.

I have lately seen examples of some of the great impurities present in commercial nitrate of uranium and the oxides of the same metal; so that I am not astonished at the anomalous results obtained by different experimenters. I am, however, in hopes of being soon in possession of a perfectly *pure* nitrate of uranium, so that from the experiments made with it some data may be derived to guide the the practical workers in the uranium processes.

With regard to the discussion at the meeting; what really took place was as follows:—At the conclusion of my paper, Mr. Williams rose, and said I was in error in supposing the precipitate I obtained by adding a caustic alkali to nitrate of uranium, to be the oxide, it being, in fact, a uranate of the alkali; and that by dissolving it in an acid I obtained a very complex salt, and not a simple one of uranium. I replied that if such were the case it would doubtless account for some anomalous results I had met with in using the *supposed* simple salts of uranium.—I am, yours truly, H. Cooper, Jun.

5, *Aberdeen Park, Highbury, Jan. 4th*, 1865.

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Talk in the Studio.

Ornamental Borders.—Mr. G. J. Tear sends us some pretty ornamental mounts for medallion photographs, intended to be mounted in a diamond form, like the diamond cameos. Our own personal taste is opposed to ornamental borders of any kind round photographs, we prefer a chaste simplicity in all such matters. But if borders be desired, those of Mr. Tear are very pretty.

Photographic Enamels.—M. Joubert has recently made some further advances in his process of photographic enamelling on glass and porcelain, by which he obtains pictures, which are fine by reflected light, as well as transparencies. We hope to have something more to say on the subject shortly.

Accident in Burning Magnesium.—At the recent meeting of the French Photographic Society, M. Placet called the attention of members to an accident occuring during the use of the magnesium light for enlarging. Some globules of the incandescent wire which was very near the condensor, were projected on to its surface, which was so corroded by its action, as to be rendered useless.

Indecent Photographs.—All lovers of photography must regret the degradation of their art by wretches such as those mentioned below, to the worst of purposes. Cases of this kind have, we are glad to say, become less frequent of late. On Friday last, James Brewer, of Castle Street, Leicester Square, dealer in photographs, and Francis Scott, or Smith, also a dealer in photographs, were summoned by Inspector Walker, for having a large quantity of obscene photographs in their possession. The photographs, which were seized by the inspector, were of a disgusting character. They were ordered to be destroyed within eight days, and the summonses dismissed. We regret the mildness of the sentence.

Opal Glass.—We have received several inquiries of late as to the possibility of obtaining opal glass ground and polished, like plate-glass, on the opal side, for printing on. We have ascertained that Messrs. Claudet and Houghton have had some prepared in this way. It is probable that other dealers may have a similar article. It is tolerably certain that it will be generally kept if the demand become general.

The Wothlytype.—In a paragraph in our last, sent by a local correspondent, some remarks by Mr. Beattie at the Bristol Naturalists Society, on the Wothlytype, are reported. Mr. Beattie states that they do not quite convey the opinion expressed, which was favourable to the Wothlytype, some successful specimens of which he encloses. He remarks: "What I did say was this, that I had got good vigorous prints, (which I exhibited and enclose one or two for you to see), but they were not so much on the paper as in it. On the question of permanency, there were differences of opinion. Theory was in favour of their permanency, yet, as they were silver prints, they might possibly give way, but *not* from the same cause, namely, albumen and hyposulphite of soda. My opinion of the Wothlytype is, that in a little time it will be commonly in use."

Mr. Ruskin on Ancient and Modern Painters.—Mr. Ruskin has commenced his promised series of papers in the *Art Journal*, under the fanciful title of "The Cestus of Aglaia." His prefatory theme is that we have now amongst us as able painters as ever lived; but they never paint as good pictures as were once painted. He says, "Without pressing the statement too far, or examining it with an unintended strictness, this I believe to be, at all events, true; that we have men amongst us now in Europe, who might have been noble painters, and are not; men whose doings are altogether as wonderful in skill, as inexhaustible in fancy, as the works of the really great painters, and yet these doings of theirs are not great. Shall I write the commonplace that rings in sequence in my ear, and draws on my hand, 'Are not Great, for they are not, in the broad human and ethical sense, Good?' I write it, and ask forgiveness for the truism, with its implied uncharitableness of blame; for this trite thing is ill understood, and little thought upon by any of us, and the implied blame is divided among us all." In a modified way, photographers might take this to heart with the painters to whom it is addressed.

The Photographic Novel.—Our conjecture as to the identity of the "Old Cantab," turns out correct. It is Mr. Sutton himself. He has commenced his new serial story, entitled "The Photographers," in his *Notes*. From what we can judge from the two first chapters, these will be the most pleasant and agreeable pages that have appeared in the *Notes*, although he does commence "very much at sea," the tale opening with a description of the passage of the packet from Guernsey to Sark. In his first instalment, the author has cleverly left his hero and heroine in a very interesting and sensational situation, leaving the reader in a state of excitement as to what is to come next. Here are Mr. Sutton's materials for a photographic novel:—There are Amateurs old and young, male and female, gentle and simple, educated and uneducated;—Professionals high and low, in broad thoroughfares and up back courts;—Paper-men and Glass Positive Men;—Stereoscopists;—Artist-photographers;—Composition-photographers;—Positive Printers;—Portrait Colourists;—Print Mounters; — Photo-Lithographers; — Stoppers and Plate Cleaners;—Albumenizers, &c. Surely amongst the good and bad of such a variety of persons, with such a diversity of occupations, a novelist need not seek in vain for some of the characters and incidents of a story.

Shakespeare and Photographic Portraiture.—An old correspondent, signing himself "Cha-meal-ion," sends us the following addition to the allusions of poets to photographic portraiture:—"Some time since one of your correspondents extracted from the plays of Shakspeare certain passages bearing on photographic art and portraiture, and promised your readers the result of his further researches in the same direction. May I be allowed to mention a domestic incident which gave rise to a happy and pertinent quotation from the same poet? I am indebted for it to my aunt, who resides with me, one of whose excellent qualities is an enthusiastic admiration of the bard. The old lady had long talked of sitting for her cârte, and it is needless to say that the announcement was hailed with acclamation, a number of poor relations (whose purse-onal attachment was undoubted) being clamorous for copies. The good creature, though feeling that awe of the camera common at an uncertain age, at last made up her mind to sit, and I take credit for the adroitness with which I shifted the responsibility of the inevitable result from my own shoulders to those of a leading West End firm. We were at breakfast when tho packet arrived from Messrs. ——. With an unwavering hand my relative opened it, and spread the contents on the table. A slight wince testified to an internal emotion, which was instantly suppressed and superseded by a smile. "My dear aunt," I said, assuming a tone of cheerful prognostication, "what result?" "Shakspeare," said the old lady, "Shakspeare, who says everything better than any one else, must speak for me. The words of the duke in 'As You like It,' exactly express my feelings—

> '*This* is no flattery; these are counsellors,
> That feelingly persuade me what I am.'"

To Correspondents.

⁂ Our New Volume.—It has been customary in offering our New Year's greeting to our friends to speak of the arrangements for the volume just commencing. We have simply to announce that the same attention will be paid to questions of current interest as before, and that a special series of papers on the art phases of photography aro in preparation. Whilst questions of scientific and art interest, and those relating to formulæ, processes, and manipulations, will still receive their full share of attention, papers of a moro purely literary character relating to photography and photographers, will be occasionally given. The articles of tho same staff, and occasional contributors who have hitherto found favour with our readers, will appear, some of the occasional writers taking place amongst our regular staff contributors. It has been our especial aim to secure not only gentlemen who are known as good writers, but those who have distinguished themselves as successful workers in the art. We may mention among those from whom regular contributions will appear, H. P. Robinson, Valentine Blanchard, H. Cooper Junr., Dr. H. Vogel, W. Crookes, F.R.S., Charles Martell, J. E. Cussans, The "Photographer's Assistant," and some others. Occasional contributions are promised by J. Spiller, Dr. Van Monckhoven, Dr. Towler, Dr. Maugham, F. R. Window, Dr. Phipson, Dr. Hill Norris, W. W. King. W. W Woodbury, J. W. Swan, B. W. Sayee, A. Hughes, W. R. Hartley, Lieut. Noverre, and several others.

A large number of Advertisements are compelled to stand over this week.

Leo.—The Year-Book just issued contains detailed directions for making chloride of gold; but none for making nitrate of silver. The latter you can make very easily; but not so cheap as you can buy it.

P. S.—We are uncertain of the cause of the spots of which you send us examples. Herr Beyrich says they proceed from a physical condition of the albumen, the result of its having been kept in an over dry-place. This causes the albumen to repel the solution in places, and makes it run off greasily, and thus cause stains and spots. The remedy he proposes is keeping the paper in a moist atmosphere before floating on the silver bath. 2. An old negative bath evaporated down, may still contain some portion of iodide of silver, which will injure it for exciting paper. You had better make it into a negative bath again.

W. H.—Both are good; but we prefer No. 1, in your list.

Bath.—After adding carbonate of soda until you are satisfied that all the silver is precipitated, leave the whole for a few hours for any turbidity to subside. Before you pour off the water as waste it may be well to take a little and see if the adding of common salt cause any further precipitate, which it would at once if any silver be left in solution.

W. H.—There is a very good manual of electrotype manipulation published by How, of Foster Lane.

L. Bristow.—One or two modifications of M. Poitevin's process of using tannin as a sensitizer have been described in our pages; one by Mr. Sutton, and another by Mr. Sayce, both of which are successful. In using the ordinary tannin process, all the manipulations must be conducted in the dark-room.

A Subscriber.—Much depends on the mode of colouring as to which paper is most suitable. For oil colouring albumenized paper is always best. For water colours some prefer plain, and some albumenized paper. 2. The bath of sulpho-cyanide of ammonia and gold will answer for ordinary silver prints, but it must be used stronger than for uranium prints; one ounce of the sulpho-cyanide in three or four ounces of water will do. It will tone and fix at the same time. 3. The sulpho-cyanide is, we think, a safer fixing agent than hypo-sulphite of soda.

Ignoramus.—There are many good manuals of chemistry for beginners. That issued in Chambers' Educational Course is an excellent one. Statham's you will find useful also. But you will gain the most information on photographic chemistry from works devoted to photography. Hardwick's manual contains much useful information. A careful study of the chemical articles in our back volumes will aid you most.

P. B. L.—There are various modes of toning transparencies. The kind of tone is much a matter of taste; we prefer a warm tone. Plates prepared with tannin are generally warm in tone, especially if acetic acid be used instead of citric acid in the developer. We have obtained a very agreeable warm purple in the wet process, by giving long exposure, and developing with an iron solution containing a large proportion of acetic acid. A dilute solution of sulphide of potassium, applied after fixing and washing will give a brown tone, a strong solution a black tone. Bichloride of mercury, followed by a dilute solution of ammonia, or of hyposulphite of soda will give a black tone. 2. If the picture be exposed, and developed sufficiently for a good transparency, it will not show much detail by reflected light.

P.—Much depends on the quality of the pyroxyline. Some samples will readily dissolve in the ratio of 6 or 8 grains to the ounce of solvents, and still give a fluid and easily manipulated collodion; others will yield a glutinous collodion with 3 grains. We prefer for negatives, a sample which works well with about 6 grains to the ounce. A good body of pyroxiline is an essential element in obtaining a vigorous image. 2. Equal parts of ether and alcohol generally give very good results. 3. The use of the salts of cadmium alone tend to make the collodion glutinous unless a suitable cotton be employed. We prefer a mixture of the salts of cadmium and ammonium for general purposes.

M. M.—Use filtered rain water for washing your plates, if you have difficulty in obtaining distilled water; or failing that, water which has been boiled and cooled again. Heating water precipitates a portion of the salts which make it hard. This will answer for developing solutions.

R. S. Aatidge.—Many of the prints forwarded are very good indeed, the chief fault in any being a little slovenliness or want of precision and care in manipulation. One of the best pictures is the portrait of yourself, which is soft, round, vigorous and well modelled. The tone is also good. 2. If you properly fill up such a form as we gave in our Year-Book, and have given in the News, and send it with fifteen stamps to our publisher, he will get a picture registered for you. The lens to which you refer is not a practicable one. You misconceive moreover the meaning; freedom from aberration does not necessarily mean the production of a perfectly flat field, nor the fitness for being worked with open aperture. The meaning of the writer in the case in question is freedom from spherical aberration. You would be merely wasting time, money, and energy, in attempting to make such a lens. The piece of glass for focussing screen is very perfectly ground. We will give your suggestions on that subject shortly.

One who Studies the News.—The prints you enclose are free from "blurring," "nubation," "halation," or any such thing. 2. The brown stain is probably due to hypo. Such a spot would most readily be caused by a particle of nitrate of silver coming in contact with the print before the hypo was washed out of it. 3. The chief use of a swinging back to a camera is to secure parallelism between the sensitive plate and the object to be taken, when it is necessary to tip the camera, as in photographing high buildings. They are less important for portraits. 4. In speaking of a stereo lens, and asking the best focus, you do not state whether you mean single or double lens; if the former, 6 inches, if the latter, 4½ inches. 5. For interiors the triple is better than any single lens, for the latter will give straight lines curved, whilst the former is free from the defect. 6. We prefer No. 2. The Almanac is now ready.

W. D. Hemphill.—Thanks for the charming specimens and letter. We shall have something to say on the subject shortly. We quote your remarks on the dead-eye question in an article we had written on the subject, which you will find on another page.

L. Bing.—We shall be happy to see you if you call at the office on a Thursday, or at our own home by appointment any other day; or to see the specimens, if you forward them.

X. Y. Z.—In order to prevent your prints curling up, so to cause difficulty in mounting, first slightly damp the prints. You can then apply the paste, or glue, or dextrine, easily. The objection to gum is, that it is apt to turn acid, and injure the picture. If thin, it soaks into the print and gives it a mottled effect.

Beta.—So far as we know, Mr. Swan intends to sell his tissue prepared ready for exciting by floating on a bath of bichromate of potash. The beauty and permanency of his prints are undoubted. The only objection to the process arises out of manipulative difficulties.

F. L.—If you coat the plate with wax before applying the collodion for enamelling, it will come away without difficulty when all is dry.

W. H. Warner.—We have generally found that with those samples of the Wothlytype which assume a ruby tint in the toning bath, no amount of gold would deepen the tone. More nitrate of silver in the collodion will modify the tone.

Articles on "Printing with Chloride of Silver in Collodion," "Amateur Photography," "Warner's Camera Stand," "Copyright," "A New Method of Enamelling Prints," "Explosions during the manufacture of Oxygen," and some other subjects; also some Reviews, are compelled to stand over until our next.

N. and several correspondents in our next.

Photographs Registered during the Past Week.

Mr. W. H. F. Taylor, 13, High Street, Windsor.
Photograph of the New Mausoleum at Frogmore of the Prince Consort.

Mr. J. H. Kay, 57, Argyle Street, Glasgow.
Photograph of Rev. Alexander Wilson, Bridgeton, Glasgow.
Two Photographs of Rev. John Robson, D.D., Glasgow.

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All Communications for tho Editor to be addressed to
32, Paternoster Row.

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THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 332.—*January* 13, 1865.

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RECOVERING SILVER FROM RESIDUES.

Are our readers, generally, in the habit of preserving anything like an accurate account of the original expenditure of silver, and of the amount recovered from residues? A very few years ago, the "waste," in most photographic establishments, was an item of so little consideration that it generally fell as a perquisite to the person who took the trouble to preserve it. This has, of course, been altered of late years: the general expenditure of silver, and also of accumulating residues, have been enormously increased; and, at the same time, the knowledge of the value of the residues, and the means of recovering the silver therefrom, has become more familiar to all photographers. We have still reason to believe, however, that the amount recovered is less than might be obtained with advantage, and without an expenditure of time, care, and reducing agents which would make the result cease to be profitable.

Messrs. Davanne and Girard state, that over 90 per cent. of the amount used may be recovered from the residues. Mr. Spiller has shown that less than 2 per cent. of the amount employed goes to form the image, and that over 80 per cent. may be obtained back again from the washing waters and fixing solution. An important question arises, then, as to the actual proportion usually recovered. We are disposed to believe, from the information which reaches us from time to time, that the amount saved by practical photographers falls considerably short of the possible amount, often not exceeding 50 per cent., and rarely reaching 70 per cent. It is very probable, indeed, that in the testing operations of an experienced chemist, a larger proportion of the precious metal may be recovered than may be found easy or practicable in the printing-room of the professional photographer; but the inquiry as to what proportion may, with ordinary care and attention, be obtained, in every-day operations, is well worth attention. With this view we shall be glad to receive from such of our readers as may have preserved an accurate account of their operations, statements of the amount recovered, and of the methods employed for comparative examination. From such statements, important and exact data may be gained, for the guidance of photographers generally, as to the necessary and unnecessary expense and waste of printing conducted on a commercial scale. Those who have not hitherto kept careful accounts of the amount expended and recovered, will probably find the comparison well worth the trouble. We subjoin a letter received from an able intelligent photographer, with a statement of expenditure and recovery during six months in a large portrait business, chiefly in cards. It will be seen that the silver obtained from ordinary waste is here a little short of 50 per cent. of the total amount employed.

Sir,—In the News of 9th December, there is an excellent article on the "Recovery of Silver from the Washings of Silver Prints."

Much, from time to time, has been said regarding this subject, and I am of opinion that a great deal yet remains to be done by photographers to make their profits as large as possible; few of them are as careful of their waste as they should be, and I have been induced to make the following remarks, in the hope that some of them may think of the matter, and save where they can, as it is neither justice to themselves, nor to the community, that such a quantity of the precious metals should run into our sewers, or be thrown into our ashpits, as if it were totally useless.

The waste may be collected with little or no expense of either time or trouble, and costs nothing but the labour to reduce it to the pure metallic state.

Subjoined is a note of the waste collected in my establishment, and, I may state, that there was no waste silver baths, nor droppings from the paper included. Should I have any bad silver baths, I reduce them by copper, and then dissolve in nitric acid. The nitrate thus formed I use for printing, the droppings from the paper all run back into the bath.

If any other of your readers have obtained a greater percentage than that noted below, I shall be glad to hear from them through the medium of your journal, as I think a great deal more could be recovered, considering the small quantity left in the finished print.

Clippings.

Paid for nitrate of silver from March, 1864, till October, 1864	£170	0	0
Waste collected during same period, when reduced to pure metal, weighed 308 ounces, valued t ...	83	10	4
	£86	9	8

We shall be glad to receive further statements on the subject, in order that a fair estimate may be formed of the average amount saved as compared with what might, without inconvenience, be recovered.

COPYRIGHT IN PICTURES AND PHOTOGRAPHIC INFRINGEMENTS.

It has been a common practice with a large class of persons to speak of all unauthorized photographs of paintings and engravings as piracies, produced without regard to the rights of property, and in defiance of the law. Having considerable regard for the fair fame and good repute of our art, we have always discouraged as far as possible, all unauthorized reproductions of subjects in which there was even a disputed title, in order that photography might not be charged with the appearance of evil. There is, however, clearly a limit to such forbearance, and it is important for print-publishers, for photographers, and especially for the public, that the subject should be thoroughly ventilated in order that the respective rights of each should be clearly defined. In another page, a "Detector," boldly enunciates the rights of the photographic copyist, and his statements and arguments are well worth the attention of all interested in the subject.

It is important in dealing with this subject, to remember that no copyright exists at common law. That is, that the idea or design of a picture is not regarded by the common law of the realm, as property. The only property in such idea or design is conferred by statute, and this being the case, the exact nature and extent of that property is defined by the statute, and also the conditions upon which it is held. Failing these conditions, the copyright is void. As regards ordinary property in objects of a tangible character the mere possession is *prima facie* evidence of right, and some one else must show a better right before the holder can be dispossessed. But in regard to property which is held simply in virtue of a statute treating it as property, compliance with the conditions of the statute, alone can secure it to the owner. In the statutes creating a copyright in engravings, the property is secured to the holder for a given period, on certain conditions, one of which is, that the name of the proprietor, and the date of publication shall be engraved on the plate, and appear on each print. It follows then, that if a single print be issued without such name and date, that the protection of the statute is lost. It will be very naturally observed by the conscientious reader that if, in the progress of the plate, a proof be taken before these formalties have been complied with, no honest man would avail himself of the accidental access to such a proof to produce pirated copies of it. Such an observation will not be gainsaid. But the circumstances under which print publishers have laid themselves open to what they term piracy, involve a deliberate surrender of the protection of the law, for a consideration which they consider remunerative. They have adopted a system of selling a certain number of copies of each engraving under the names of artist's proofs, proofs before letters, &c., before any name or date affixed to the plate. These are always supposed to be prints from the plate in its best state, and often command enormously high prices on this account. The fact that much trickery has been practised in connection with this custom, and that an unjustifiably large number of professed proofs have often been taken from a plate, and the public shamefully cheated, is not to the purpose here. We simply wish to point out the fact that it is for the high prices to be obtained from unlettered proof-impressions that the proprietor deliberately sacrifices his copyright by violating the conditions upon which it is held. In regard to all such prints therefore, the print-publisher is clearly not justified in complaining of piracy. He is the victim of no accident or unforeseen complication of circumstances. He has deliberately surrendered his claim for a *quid pro quo* which he at the time considered sufficient, or he would not have done it.

But the great folly, we might almost say the criminal folly of print-publishers, has been in refusing to avail themselves of the aid of photography to popularise the works they possess and by filling the market with good and authorized copies, destroy the market for inferior, and unauthorized copies. This is an age in which the public demands cheap and good art, and photography is ready to carry it into the homes of the most lowly. But for the narrow-minded folly of many publishers, they might have aided in a good work, reaped large profits from the issue of photographs, and at the same time, instead of injuring the sale of their engravings, they would simply have advertised, and made them popular, by the small photographic copies scattered broadcast at reasonable prices through the land. They have for the most part, unfortunately for themselves, elected differently, and have therefore thrown the trade into other, and more enterprizing hands. We have before us at this moment a catalogue of about two thousand photographs, chiefly copies of pictures, ancient and modern, issued by one dealer alone, whose business, we have reason to believe, is equal to his enterprize.

Print-publishers, and buyers of pictures, have the matter still in their hands as regards all new pictures, and the sooner they appreciate the value of photography as a means of reproducing and popularising their pictures, the better for themselves, the better for art, and the better for the public at large.

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EXPLOSIONS DURING THE MANUFACTURE OF OXYGEN GAS.

THE recent fatal explosion at Manchester has excited universal attention amongst all interested in the preparation of oxygen. In our report of the meeting of the London Photographic Society, some discussion on the subject arising out of a letter forwarded by Mr. How, and a safety retort. Regarding the latter, we may remark some misunderstanding seemed to exist. As it was made of thick iron it was imagined that it was intended for the fire. The usual mode of heating it is on a ring gas burner, the thick iron retaining the heat better than the thin retorts of wrought iron. Regarding the fitting of the top, the principle upon which safety depends was obvious. The force of an explosion is governed as much by the resistance to be overcome, as by the expansive power of the exploding material. If but a slight resistance be offered to the explosion, it passes comparatively inoffensively. In the retort in question, the cover merely fitting so well as to be air tight, without being screwed or otherwise fastened, offers little resistance, and is blown off harmlessly. Mr. Swan suggests that another precaution may be found, in many cases, valuable. It consists in using, in addition to the Woulff's bottle containing water for purifying, a second Woulff's bottle, which shall be empty, to act as a trap to prevent the possibility of any of the water from the purifier getting injected into the retort, and thus causing an explosion, a casualty if not probable at least very possible, if a vacuum be formed in the pipe through any accidental fall in the temperature. It may perhaps be useful here to repeat the various precautions upon observing the whole or many of which safety depends.

The use, in all cases, of a safety retort. Either the top described by Mr. How, or a connection of india-rubber tube for the pipes will act as a safety valve, as the explosion will be harmless in proportion as the gas meets with small resistance in making its escape.

The examination of the oxide of manganese to ascertain if organic matter, capable of yielding hydrogen, be present. If a little be mixed with half its own weight of chlorate of potash, and held in a shovel over the fire, small scintillations running quietly over the surface indicate safety, flashing into a flame or detonating indicate danger.

Using the manganese in a granular form, instead of in a fine powder, mixing very intimately with the chlorate of of potash, and drying the mixture thoroughly, all tend to safety.

Using a slow heat, from a ring gas burner, and using a second Woulff's bottle, empty, using the pipes sufficiently wide, and taking care that they are not clogged up, will all tend to safety.

We here subjoin Mr. How's letter, and also two from other correspondents. We hope the various suggestions will aid in preventing the recurrence of accidents like the recent lamentable event at Manchester.

SIR,—I have thought it would not be out of place on the present occasion, knowing that so many amateurs as well as professional photographers are using the oxy-hydrogen light in the enlarging process and for other purposes, to submit to this society what is (in my estimation) the most efficient and safe form of retort for the preparation of oxygen gas from chlorate of potash and oxide of manganese, as with it there is but little possibility of the recurrence of an accident similar to that which has so lately occupied the attention of the public. (I allude to that deplorable event which occurred but a few weeks since in Manchester.)

The retorts usually employed in the preparation of oxygen gas are made of either copper or iron, the form being spherical, or more commonly conical; the tops are made to screw off and on for the introduction of the material required for the manufacture of the gas, and also for cleaning out the exhausted composition. So far, so good; and no accident can possibly happen, supposing that certain necessary precautions be taken, such as having the substances well dried before mixing, and kept free from damp till required for use, having all the pipes from the retort to the gas-bag not less in internal diameter than half an inch. But if the materials be damp, the chances are that the small pipes such as are generally used would become immediately choked, and the generation of the gas being continued, something must give way, and an explosion is the result.

The purity of the materials employed is of course of great importance. In the Manchester case, I think that the carbon found with the oxide of manganese must have been introduced by accident or through carelessness, as I can hardly imagine any person fraudulently adulterating a substance of the kind; the retail price of which is 3d. per lb., and the wholesale considerably less.

By making use of a retort of the shape which I have the pleasure of submitting to you this evening, no accident can possibly happen—even if the material be wet, and the pipes choked up—worse than the head of the retort being blown off, and the contents wasted.

The mouth of the retort is of large diameter, and turned perfectly true on the outside of the neck in a lathe, and with a slide rest. The head is made of gun metal, and turned equally true to fit on the neck of the body, which is of iron, and then both are ground together, and made perfectly air-tight.—I am, sir, yours, &c., James How.

2, *Foster Lane, January* 3, 1865.

Dear Sir,—On reading in the Photographic News of last week, the account of the lamentable accident at Manchester, from preparing oxygen gas with chlorate of potass, and binoxide of manganese, I am reminded of some experiences of my own in conducting the same process some years ago, with the same materials; which, if they do not throw any light on the late unfortunate occurrence, may perhaps be useful in preventing accidents. I had procured a large phantasmagoria lantern from a London optician, to which the oxy-calcium light was adapted. The apparatus for obtaining oxygen, consisted of a copper globe, with a piece of brass tube about 30 inches long, attached by fitting pretty tightly into a short neck; this tube led the gas to the washing bottle, with which it was connected by means of a piece of india-rubber tubing about ½-inch diameter, and another piece of similar, but smaller tubing connected the bottle with the gas-bag. On the first occasion of using the apparatus, I followed the directions given with it, by introducing a mixture of two ounces of chlorate of potash, with one ounce of binoxide of manganese within the retort, and applying heat by means of a gas burner. There was no evolution of the gas for some minutes, but suddenly it began to issue with great violence from the retort into the washing bottle, and the production of gas was so rapid, that the tube from the bottle to the gas-bag could not carry it off sufficiently fast to prevent an explosion of the apparatus; fortunately the india-rubber tube yielded to the pressure, so that no great harm was done, but I was considerably startled. The whole of the gas in the material was liberated in a few seconds, and you can conceive the result if the retort had been of too small diameter, or had become partially or wholly stopped. In subsequent operations, I always looked carefully to the condition of the retort tube, and received the gas into a gas-holder of Pepys' form, transferring it afterwards to the gas-bag.

The rapidity with which the gas was sent into the holder while operating upon so small a quantity of material, viz., three ounces, was such as to force a stream of water an inch in diameter, from the aperture of the gas-holder to the ceiling of the room. The operation was disagreeable from the risk there was of an explosion, and I sought, by employing as low heat as would suffice to disengage the gas, to modify its rapidity of evolution, but to no purpose, for as soon as the necessary degree of heat was attained, the gas was at once produced with the same violence. I found that to obtain a more gradual action, a smaller proportion of the binoxide must be employed, instead of two ounces chlorate to one of binoxide, two ounces of the former to two drachms, or even one drachm, of the latter was sufficient; the quantity of gas produced being about the same, but disengaged more quietly. It seems that the action of the binoxide is not so much chemical as mechanical, and depends much on the degree of fineness of its particles; the platinized silver plate of Smee's battery I take to be a parallel case of the influence of points on the disengagement of gas. A chemical friend of mine has told me that finely powdered pummice-stone is equally efficacious as the binoxide, but I have not tried it. I found on procuring a fresh supply of binoxide that the first specimen I used was much more finely powdered than usual, hence the energy of its action; the coarser could be employed safely in much larger proportions. If what has been written above does not indicate the true cause of the Manchester accident, it shows the necessity there is of using even *pure* materials with caution. W. W.

Buckingham, December 28, 1864.

Dear Sir,—As a supplement to your excellent remarks on the lamentable accident that happened at Manchester, I beg to offer the result of my own experience in the manufacture of oxygen gas, and at the same time, propose a method of preparation perfectly free from danger. Manganese, no doubt, is perfectly safe when pure; but from the very facility with which it may be adulterated with carbonaceous and hydrogen compounds, such as culm, soot, charcoal, dust, &c., it must and ought to be rejected by all who put any value on their lives. Gunpowper is a mild explosive, compared to such a mixture with chlorate of potash.

Then again, as regards apparatus, with arrangements for easy detachment on a slight over-pressure, as proposed by Mr. How, it does not cure the evil, as Mr. Mayall very properly remarked, that parts of an apparatus being blown off would act as projectiles. I have tried all known methods of producing oxygen largely, and find none equal to the method I have finally adopted for producing the gas on the largest scale, also for facility of production, coming more readily and freely than from a mixture of manganese and chlorate, and above all, the absolute safety of the process, and this is its highest recommendation. I have tried Mr. Robins' method, as proposed by you, and the result is, that it is perfectly worthless for the purpose in question. As an illustration, from half an ounce of chlorate mixture (value one penny) I can fill four pint bottles with gas. From a quarter of a pound of Mr. Robins' (price one shilling and sixpence) so called oxygenesis, I never could fill one pint bottle. Besides, the price of it is sufficient to prevent its being used, being five or six shillings a pound.

The process simply is to substitute clean and dry sand for manganese; any railway excavation will supply the sand, and in the first place it must be passed through a fine sieve, then washed till the water passes off clean and pure, and as a further precaution, heated in a crucible to low redness. However the heating may be omitted, if carefully washed, the object being to get rid of everything likely to produce hydrogen.

Then equal parts of chlorate and this dry sand being intimately mixed in a mortar, is put into the retort as usual, and a common fire or gas jets used. The gas will be obtained in great abundance, and at a lower temperature than with manganese; lastly, as I said before, there is absolute safety with this process. When I was in the practice of using manganese with the chlorate, I was continually subjected to explosions, only rendered innocuous by troublesome anticipatory measures to destroy their effects. I hope that every one engaged in the production of oxygen gas, will adopt this method, as I have the fullest confidence in its especial feature, viz. its safety, as well as possessing all the advantages of the process with manganese.

Peter Henderson.

3, *Park Hill, Clapham, January* 11, 1865.

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MODIFICATION OF NEGATIVES BY COLOURED GLASS.

BY M. HUMBERT DE MOLARD.

I cannot too strongly urge upon the attention of operators the observations made by M. Cassan. They are so just and true, that it is difficult to add anything to them. It is quite natural that many photographers, observant and anxious respecting their art, should encounter this question on the same ground. Who among us does not remember the manipulations practised in photography at the outset. We did not then de-iodize our negatives, they were simply passed through bromide of potassium, the effect of which was to annihilate, more or less, the sensibility of the film after development. The negative, thus fixed, washed, dried, and not deprived internally of its greenish-yellow hue of bromo-iodide of silver, furnished, nevertheless, a positive harmonious picture, pleasing in its details. Subsequently, experience led to the recognition that the primitive film of iodide of silver, left in the interior of the substance of the negative, was a cause of the rapid destruction of the picture, and no time was lost in remedying this defect, by de-iodizing the negative completely with hyposulphite of soda, or, in other terms, allowing to subsist in the negative only the imprint of reduced gallo-nitrate of silver. But then, what a change! the negative, if it were not most frequently reduced to a complete phantom, very often presented only a harsh and inharmonious effect. Therefore, as this inconvenience frequently occurred, is it not a very simple matter that the idea should occur to many of us to remedy a negative rendered excessively thin by de-iodizing, to restore the original tint to which it owed its value, and this, be it understood, not by a new iodizing, which would probably compromise everything, but by the aid of inoffensive coloured varnishes, applicable at the pleasure of the operator, either on the face or the back of the plate, wholly or partially, according as certain parts, more or less necessary to be protected (such as the skies), are in such a state that we are afraid to touch them, by placing a plate of glass upon the printing frame, and pass through it any tint of coloured light appropriate to a desired effect.

All colouring matters soluble in alcohol at 40 degrees, are suitable for colouring varnishes, and all the alcoholic varnishes daily employed in photography are apt to receive them. The aniline colours dissolved in alcohol to saturation, employed separately, or combined with each other, yield, with the greatest facility, the scale of all desirable colours. Non-sensitized collodion mixed with half the quantity of coloured varnish, gives a denser film, spreads well, dries easily, and suits this kind of operation admirably.

The aniline colours, it is said, are not entirely permanent when exposed to the solar rays. What matters? The richness and abundance of their tints are unrivalled. Besides, we must not lose sight, in this particular, of the fact, that their employment will never be other than exceptional and transitory, easily repeated at any moment, and without expense. It is true that stained glass, prepared in the furnace for church windows, &c., may appear to advantageously replace these tinted varnishes; but, besides it being not easy to find the coloured glasses everywhere, I have found, by experience, that they cannot always be obtained of the desired tints, while, with a few bottles of the primarily coloured liquids, the operator can always attain his object.—*Bulletin de la Société Française de Photographie.*

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WARNER'S CAMERA STAND.*

Of all the pieces of apparatus appertaining to a photographer's outfit, the camera stand for landscape purposes is the one that has received the least attention, and yet there is not one piece more serviceable, or of more importance. When I first commenced photography some eight years ago as an amateur, my attention was early called to this deficiency, and having once "come to grief" on the pavement of a cathedral, I set about remedying the matter.

The old stand—the one *now* in general use—has no means for keeping the legs equidistant from each other, except by tying them together with string or worsted, as recommended by one of the correspondents in the *British Journal of Photography*, or by placing the feet in pads of cork when working on a slippery floor; it also has no means of increasing the tilt of the camera, neither can it be worked at a higher or lower elevation—it cannot be used downwards, thus: ↓ or inclined, thus: ↗ or upwards, thus: ↑ or declined, thus: ↘ and turned round completely in either position without at the same time disturbing the base. Neither can it (the legs) be used laterally, or dispensed with altogether. The only merit it has is its extreme portability.

The new stand which I beg this evening to offer to your notice, and which has been in constant use by me for upwards of five years, has the merit of meeting all these difficulties, and of doing a great deal more, with almost as much portability as the old one. Its idea was taken from the human frame, which, while it stands firm on its base (legs), the head is enabled to turn either way, right or left, up or down, but only partially round—in the stand before you, wholly round. It combines the English tripod and the French chamber stand. It may be used with or without the legs. It is equally as well adapted for the amateur as for the professional photographer, either in or out of the studio, and is one which, when once adopted, will not afterwards be thrown aside as worthless. And now to offer you a few ordinary cases in which the old stand may be compared with the new as to comparative advantages.

We will suppose, *e. g.*, that you have to make a special picture of a large and lofty building in a confined space (say a cathedral) which is often surrounded for the most part by walls and buildings, the former not more than nine inches in width, and as rough as possible. Your only position to get this particular view is from the top of a wall.—Here, with the old stand you would be *hors de combat*. You cannot stand it *on* the wall without the legs, you have no base, and if you use the legs, you can get no tilt, beyond what is given you by the rising front of your camera, and you must either adjust the stops in your lens before you focus, or run the risk of disturbing the equilibrium of the whole by doing it afterwards. In short, if a shower of rain or a heavy puff of wind came, whilst you were preparing your plate, you would be in continued dread of ruinous catastrophe on the one hand, or of a general shift on the other, rendering all your previous efforts useless. I would here state that with every picture I carefully level the camera, which with the old stand, is in some cases an impossibility, and a vast deal more blame is often laid on the lens—the *poor lens*—than need be, as by its use all objects are gotten in their proper position on the plate as regards perspective. Take another case. You have to take a picture of a hall, or an interior, &c., the floor being of marble, encaustic tiles with a glazed surface, or of glass itself. Your first question is, "How am I to secure my legs?" You *may* do it with weights certainly, but these are not always handy, and are liable to shift, and perhaps, when by good luck you have everything *just* right, a lady passing with her crinoline upsets or disarranges the whole; or on the same floor you have to take a ceiling, the capital of a pillar, a bracket, corona, &c.

Lastly: you are upon a narrow bridge with a precipice below you of several hundred feet; you desire to represent this fact, and to give a vivid representation of the whirl and din beneath your feet; or, you are at the bottom upon rocks slimy and slippery, and you desire to represent the chasm with the bridge above. With the old stand what in either case would you do? Get further away from it? No; you cannot do that, the trees are in the way, and there is no foot-hold—the sides are perpendicular. You would let it alone, and say it was impossible! it couldn't be done. Or, as some gentlemen would put it, "*I* can't do it, and *I'm* sure if *I* can't do it, *nobody* else can." To those who would say this, let me add one word—"*impossible*" is not to be found in a photographer's dictionary. Well, it is just to meet all these difficulties that I offer my stand. I am not got going to hamper it with any registration or patent. I shall be quite content if *you* consider it satisfactory and able to meet the case. To my brother photographers I freely offer it, hoping it may conduce to their enjoyment and welfare. The pattern is here appended, with a description, and any one may make it who pleases :—

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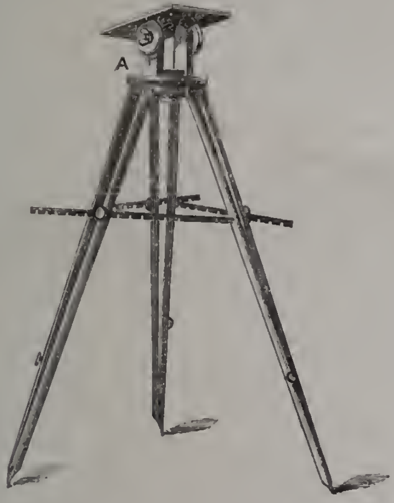
* Read by Mr. W. H. Warner, at a Meeting of the North London Photographic Association, Dec. 21, 1864.



[To be seen at Mr. Hare's, Lower Calthorpe Street.]

It consists of the ordinary camera legs, pointed at foot and hinged at bottom, without the iron stretcher. These are fastened to a circular disc of wood or tripod by means of a screw passing through the brass eye at top of the leg, the projection of the tripod and the other eye of the leg meeting it on the other side, the tripod or disc thus being in the middle. About eighteen inches from the top of each leg are two screws—one holding a light bar of iron notched at regular intervals, the other a milled screw working in a boss or nut, while a smaller one at the foot of the leg keeps the bar fast and steady when not in use. On the top of the tripod (which is perfectly level) is a circular table, on which at equal distances is placed a strong framework (A); on the side of each pillar are attached, by means of a screw passing through them and the framework, two pieces or discs of wood, to which is fastened the camera table with a hole in the centre for attaching the camera. In the bottom bar of the framework a spirit-level can be let in if desired. These two discs give elevation or depression at pleasure, and clamping the screw keeps them firm. The whole is connected with the legs by a thumb-screw passing underneath the tripod and into the crossbar; this gives the circular motion, and, being clamped, this also is firm.

In working, the legs are first extended, one of the iron bars is placed across at the desired height and secured, the table is brought to a level and made fast, then the camera with lens is placed thereon and attached in the usual manner. Now with your focussing cloth placed on the bar, you carry your camera to the desired spot (say the choir of Hereford Cathedral; *this*, being paved with highly glazed encaustic tiles, will bring out many of the advantages of the stand). Well, the camera being put down, you at once put up the two remaining bars, making them temporarily secure; you can now carefully select your picture, which, having done, you shift the stand if necessary, and, having first ascertained if it be level, altering the bars accordingly, you clamp all up, viz., bars and tripod screws, and your camera is as firm as if standing on a three-legged table. Now the picture you wish to take involves a tilt. In order to get in the crown of "*that particular*" arch, you must raise your front to its fullest extent; but this is not sufficient: so, by means of the side screw attached to the disc supporting the table, holding the camera in the left hand, looking in at the focussing screen, and with the screw in the right hand, you raise it a little more. There! now it is quite right.

In order to retain in your memory that *exact* elevation or similar positions on future occasions (supposing your lenses will admit of it), you note down where the index finger on the side of the disc points on the scale (divided and numbered into sixteenths and eighths of an inch, the level of the camera table being defined by a red line on the scale projecting below the same—the other lines being marked in black), attached to the pillar nearest the side screw, and then you proceed to work. Thus you can keep a careful inventory of the amount of tilt all or any of your lenses will bear.

Should you desire to alter your camera, say half a circle either way, you need only loosen the thumb screw and turn the table round to the required spot, without alteration of the base, lowering or elevating the table as required.

I may add, that when the camera is placed in position, it is not easily upset unless *wilfully* done. Many a crinoline has swept against the legs of my stand when I have been at work, and they have never been shifted or altered in the slightest degree. Perhaps these Scotch articles of dress may be made of heavier materials than the English, and hence the tender inquiry of my friend, Mr. George Wilson, on this point.

Should it be desired to take an object flat on the ground—a monumental brass for instance—it will be necessary to extend the legs very wide, to lower the camera, bringing it nearly level; then by clamping the tripod screws very tightly, the legs will stand in the required position. Should this *not* be sufficient, a piece of whipcord attached to each screw (on the leg) will have the desired effect; but I have never found this to be requisite.

Occasionally, it is necessary, when working in old churches, &c., to dispense with the natural support of the legs, trusting only to the pew tops, which are very narrow and very high. In this case, the legs are extended horizontally, and lying flat, or across, as the case may be, are clamped tightly by the tripod screws, in order to keep them in position, and often the camera is sitting over a pew, &c., resting entirely on these screws, yet in such a position, the elevation, depression, and circular motion is at all times free and unimpeded.

The table supporting the camera may be arranged for different cameras to work at pleasure.

I am enabled to announce that, by the kindness of Mr. George Hare, the cost of this stand will not be much greater than that of the old one, the advantages being duly taken into consideration.

W. H. Warner.

P.S.—I beg to add, that since the meeting of the North London Association, some little alterations have been attended to connected with the stand, which time did not permit of before, and this paper has therefore been slightly altered to meet the same.

At the conclusion of the paper, a conversational discussion ensued.

Mr. **Hislop** described a very simple top which he attached to his camera stand, consisting of two pieces of wood connected with a hinge, opening like a book. This permitted the camera to be placed in any position, from horizontal to vertical, without any trouble.

Mr. Hislop will, we believe, describe his very simple and useful camera stand more fully, and exhibit it at an early meeting.

Mr. **King** objected that Mr. Warner's stand did not permit the camera to be placed quite in a vertical position, as it would be required in photographing ceilings or brasses.

Mr. **Warner** said, that was a matter of detail easily obviated by slightly modifying the size of the top. He referred to the necessity for such facilities, and illustrated it by describing some operations at Hereford, by Mr. Bedford, in which the camera was supported by a pocket-book, two prayer-books, and a hymn-book, the whole being lashed to the top of some steps.

Mr. **HISLOP** referred to an experience in Wales, when the camera stand was placed on some slippery rocks. The support gave way, and all went down. He had ever afterwards used a cord round the legs of the stand. It was easily done, and quite efficient.

Mr. **COLE** referred to his experience in photographing buildings, and the frequent difficulty of obtaining a secure position on the roofs of houses, for whilst he rarely had much trouble in obtaining permission to go there, he never had permission to punch holes in the leads for his camera stand. To secure the legs, he had always used three pieces of deal, worth about twopence, which served perfectly as stays to hold the legs rigidly in position. Pieces of blind lath served every purpose. He should hesitate to place a heavy camera on the stand exhibited.

Mr. **WARNER** was in the habit of using it with a large camera.

Mr. **COLLIS** said, that iron stays, the same as those on Mr. Warner's stand, had been used for ten years.

Mr. **FOXLEE** said, they were always used on the stands of theodolites.

After some further conversation, Mr. Warner received a vote of thanks; and the discussion on the subject terminated.

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PHOTOGRAPHS IN PRINTING INK.

BY JOHN POUNCY.*

I HAVE the honour to appear before you this evening as the inventor of Photographic Carbon Printing. It is now about seven years since I commenced working in this direction. So various have been the methods by which I have worked, and so numerous have been the results, that I fear I should exhaust your patience before I could relate a tenth part of my experiments, were I even to make the attempt.

A review of my past labours would call to mind many pleasing incidents, but many recollections of periods when I have been overwhelmed with failures and disappointments, so much so that I have sometimes been driven to despair, and almost without hope of success, staying up till one, two, and three o'clock in the morning, developing pictures exposed during the day, till I have got in such a conglomeration of difficulties that I scarcely knew what course to pursue. Sometimes my pictures would not develop, at others everything would go on as I wished, and the picture appear beautiful; but the next moment all had vanished, and I seemed as far from accomplishing my desire as when I began. In this matter, as in all others where the object is worth pursuing, I soon found there was no royal road to success.

Several times my health has broken, and illness following, work had to be given up, sometimes for weeks together; nevertheless, by God's help, I have continued to the present, and hope this evening to prove to your satisfaction that I have not laboured in vain.

The process, which I am about to bring more prominently before your notice, is that of producing photographs direct from the negative in printing-ink, by which undoubted permanency is secured in addition to all the beauty and detail of ordinary photographs. My chief object will be, not only to lay before you the working details or the methods employed, but also to show by actual experiments its advantages over any other process hitherto known. Herein, I think, you will perceive the difference between my actual experiments and the exhibition of a few specimens got up for the purpose of being seen and talked about only.

The first time I publicly announced the fact of being able to produce photographs in printers' ink, I requested to be put to the test. I adhere to the same principle this evening. Deeds, not words, I contend for. Consequently, I shall be most happy to answer any questions in reference to my subject this evening, and if, sir, you would like to convene a meeting, with any number of gentlemen, hereafter, for further experiments, I shall be very pleased to meet them.

Now, sir, as I have already hinted, it is next to impossible to give you details of all the steps by which I have been led to the results that I shall presently show you; yet a brief outline may not be uninteresting.

I must here remind you that I claim the original process, by which the first carbon photographs were ever produced (this fact was first made known in "Sutton's Notes," in March, 1858), and I am willing to give £5 each for any specimens of carbon photographs, with satisfactory proof that they were produced prior to mine. It consisted in mixing various colouring matters, such as carbon, logwood, cochineal, &c., with bichromates as the sensitive agent. You will find this mentioned in the *Photographic Journal* of January, 1859, and, as will be there seen, I produced pictures that could not be distinguished from silver prints. This process was most useful for reproducing copies of prints, engravings, &c., which doubtless you know, has since been adopted by Colonel James, of the Ordnance Survey Department, Mr. Osborne, and others, and by which process we have since had *fac similes* of the Doomsday Book. But being very desirous of obtaining photographs from nature on stone, so that copies could be printed therefrom, I have worked very much in that direction, and endeavoured to make a greasy ink, in which I could produce a photograph direct from the negative, the sensitive agent in which is principally bitumen. In order to avoid the trouble of reversing the negative I endeavoured to produce the picture on paper and then transfer to stone, so that my subject should not be inverted; but when I applied my greasy solution to the surface of albumenized paper the whole appeared to be absorbed, and the back of the so prepared paper presented a finer surface than the front, on which the sensitive agent had been applied; consequently, I placed the non-prepared surface of the paper in contact with the negative, and the result of the experiment is the picture before you, which you will perceive appears on neither surface, but in the paper. This was amongst my first experiments. This, I believe, to be the first photograph ever printed with the non-prepared surface in contact with the negative. Not succeeding to my satisfaction, I threw it aside, and again pursued my original course for a time. Still desirous of obtaining a good stone process, from which I could print not only *copies* but photographs from nature, I prepared the surface of the stone with bitumen and greasy matter dissolved in benzole, and when dry grained the prepared surface with fine dry sand, so that the light might have access *into* the surface of the stone, and also to prevent the picture from clogging in the after operation of printing. This did not satisfy. I next placed a veil between the surface of the stone and the negative. This required much longer exposure. I then added to the bitumen and greasy matter bichromate of potass, ground very fine in benzole and palm oil, as the little dissolved in spirit would not be sufficient. I was also dissatisfied with this. I next endeavoured to produce a photograph on mica, placing the non-prepared surface towards the negative, hoping, after development, to transfer it to stone. After many trials I threw this aside also, because, although I succeeded in obtaining a picture in greasy matter, it would not transfer to stone, there being no means of loosening the greasy picture from the mica. I again resorted to paper, and at this time, tracing paper, covering the surface with the greasy sensitive solution, and when dry exposing with the non-prepared side towards the negative, and then developed with turpentine. By this method I obtained very good pictures of any subject, with perfect detail and half tone. I next endeavoured to transfer those pictures so obtained to the face of a finely grained lithographic stone, by rolling it through the press and damping the back of the paper with benzole, thinking the greasy matter would go into the surface of the stone, and leave the paper to be taken away; but this would not answer, the benzole operating through the paper caused the picture to spread and become blurred and imperfect. The next step was to prepare the surface of the transfer paper, so that the greasy matter which formed the picture and the paper would easily separate; this, of course, is very simple when we know the way. I then covered the surface of tracing paper with a solution of gum arabic before applying the sensitive coating of greasy matter, so that when I had obtained the picture and rolled it through the press, on the face of the stone in the usual way, the paper came off very easy by damping, hence I could produce a photograph in greasy matter, on the face of a lithographic stone, as perfect in all respects as a silver print on paper. I consider this the most important step hitherto gained in press photography, it being quite certain that we cannot obtain perfect results from an imperfect transfer, which by no other process can be produced. This fact I made known at a meeting of the Photographic Society of London, Nov. 4, 1862, but it appeared to contain little or no interest to those assembled. Having got thus far, viz., producing good photographic transfers in greasy matter for stone or metal. I considered it must follow as a matter of course that I could produce photographs in black or coloured greasy ink, for up to this point, be it remembered, colour was no object. I next turned my attention to the production of positives in printers' ink direct from the negative, to remain as such. Here the greatest difficulty was to procure a colourless transparent paper; it was then I began to work on sheets of gelatine. One of my early pictures on gelatine is now before you, and you will observe it presents the appearance of the negative having moved, this being caused by gelatine having contracted. I shall have more to say with reference to gelatine before I close.

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* Read at a meeting of the Photographic Society of Scotland, Dec. 13th.

For a long time I worked with black ink only, which, with bitumen and bichromate of potass, was not at all times a pleasing colour. My next effort was to work with any coloured ink, so that any tint might be obtained. Here my difficulties at first greatly increased. I could not for a long time get various colours to develop clean, many of which require an increase of greasy matter mixed with them. After repeated failures and renewed efforts, I am now able to produce photographs in any colour or pigment. How far I have succeeded the specimens before you this evening will prove, all of which comprise about ten different tints.

A sample of the paper I now work on is before you, which, after being made transparent, is coated with clear size or gelatine, and then with a coat of shellac varnish, before applying the sensitive ink. (The importance of this coat of size and varnish you will see more fully before I finish my remarks.) We next apply the sensitive ink.

This I hold in my hand is a piece of the sensitive ink paper prepared in July last. It will keep sensitive an indefinite time, if preserved from light. Those large portraits now before you were printed from this making in November. It will keep also any length of time after exposure before developing, if required. Here is another piece which was exposed under a negative about a month since, which I propose to cut in halves, one half to be sealed up in the presence of this meeting, to be developed this time twelve months; the other half we will now develop by immersing it in turpentine or benzole, or what is much cheaper, mineral naphtha, with a little greasy matter added, finishing with clean turpentine, all of which can be used until very thick with ink, and afterwards used for painting purposes, or the turpentine distilled again for developing. You will now perceive that just in proportion as light has passed through the negative so it has hardened the ink. The parts not operated on by light remain soluble and are now dissolved off. We now pin it to a board covered with blotting paper to dry.

I next transfer the picture to another sheet of paper or cardboard, by varnishing the face of the picture when dry in the same way as we should gum or paste any ordinary photograph for mounting. In a few minutes the varnish will become "tacky" or partially dry, and then it is laid on evenly in close contact with the other surface, and afterwards screwed in a press. The press most suitable is that used for copying letters.

This picture, you will perceive, has the transparent tissue on its face, and, after damping it with a sponge and warm water, it will easily come off, leaving the picture on the other surface. This tissue can be used again, as you will presently see. Here you will see the good of the coat of size on the paper before the sensitive ink, which I just now alluded to, the water operating upon which separates it from the ink. Under-exposed pictures are no good: if over-exposed, they make good transparencies, and can be used for a variety of purposes: as a substitute for stained glass for staircase windows, hall doors, lamps, &c., and by placing the photographs between two sheets of glass it would not be operated on by the sun, the material colour standing the effect of light. Those I now submit to your notice are over-exposed as positives. One feature they possess I beg to call your particular attention to; that, although possessing great depth of colour, the whites are perfectly pure.

Another method of mounting can be pursued by those who prefer it, which is to proceed as before, and, instead of removing the paper, varnish it with the same varnish as that used for transferring.

A third method of mounting can be adopted by reversing the negative, as follows:—Cover a piece of the tranparent tissue which we have just removed with a varnish made by dissolving india-rubber in benzole, also the film side of the negative; now place both together and let them remain till quite dry; then place them in a dish of clean cold water, when the negative will leave the glass firmly attached to the transparent tissue. It can then be placed in the printing frame either side, and thus print without the subject being inverted. Here is a negative so treated, which will print as well as those on glass. Those who wish to produce negatives by this process can do so by first over-printing a positive and printing from the same a negative, which can be used as such.

Another class of specimens I wish to draw your attention to are those produced on gelatine, which you will perceive are widely different from the first I showed you. We should think that this material would require a shorter exposure, but such is not the case. Very good results are to be obtained, if the prepared sheets are kept perfectly dry; but I am not certain that it is superior to my transparent paper. The greatest difficulty I have experienced is in mounting. The most successful way is first to varnish the face of the picture with the transfer varnish before mentioned, and when dry again varnish with a varnish made by dissolving canada balsam in turpentine, and when "tacky" press the picture in contact with paper or cardboard. This varnish any operator can easily make by obtaining canada balsam and thinning it for use with turpentine. I have here also a specimen on mica, a material that can be used as well as paper or gelatine.

I have already detailed some of my experiments to obtain transfers for stone, which, as I have now shown you, was in reality producing positives in printing ink. I now come to the application of the process as press photography, viz., for stone or metal, and printing therefrom. The specimens I now produce are some of the results.

Another important application of the process is for the decoration of china. The frame of specimens before you are all produced in ceramic colours, the whole of which can be transferred to and burnt on china, which I am prepared to do at any time, in the presence of any number of persons who feel interested in the matter.

I sent specimens of this kind to the Photographic Society of France in March last, and made the same offer, in competition for the prize founded by Le Duc de Luynes, to which offer I received no answer. I next show you a small plate in what is termed "biscuit"—that is, before the glaze is applied—on which you perceive the photograph is so transferred. The next step is to apply the glaze and place it in the oven usually employed, and the result will be a blue photograph on a white ground, the colouring matter being oxide of cobalt.

This larger plate has passed through the latter ordeal. The photograph before being transferred was produced in the same way as those I have already shown you, substituting ceramic colour for printing ink. By this process the good lady of the house will be able to have photographs of all the members of the family in her china tea service, or any gentleman can obtain a dinner or dessert service decorated with various photographic views of his estate, his favourite horses, dogs, &c.

I have thus endeavoured to lay before you the various applications of my process, by which, as you have seen, I can produce in printing ink of any colour direct from the negative photographic *positives, negatives, transparencies, transfers for lithographic or press printing, photographs* in *ceramic colours*, which can be transferred to and *burnt on china, earthenware, &c.*

I am bold to assert that this process embraces a wider field than any other system of photographic printing. It is true that I have spent much time and labour to arrive at these results.

But, sir, if by one pair of hands and this shallow pate of mine this process has thus far prevailed, who shall predict the limits or extent of its application when it shall have received the same amount of attention and talent that has hitherto been given to silver printing.

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Proceedings of Societies.

West Kent Natural History, Microscopic, and Photographic Society.

At a meeting of the Society, held at Blackheath, on Wednesday, December 21st, Flaxman Spurrell, Esq., President, in the chair, a paper was read by Charles Heisch, Esq., Professor of Chemistry in the Middlesex Hospital Medical College, on

LIME TONING.

Mr. Heisch began by remarking, that all must remember about two years since, the introduction of a process for toning with a mixture of chloride of lime, and chloride of gold. For some time, no definite directions appeared, and many letters were written to the journals, containing accounts of experiments on the subject, mostly ending in failure. At length a more definite receipt was given, which consisted in making a saturated solution of chloride of lime, shaking it up with carbonate of lime, and then taking one dram of this solution, three grains of chloride of gold, and adding them to one quart of water. In this bath the prints were to be left for about one hour. Here was an apparently definite and simple formula, but what was the result? The next week the journals were full of letters from those who had followed the directions exactly, and who almost without exception had bleached instead of toning their proofs. Various reasons for this were put forth, all more or less unsatisfactory. Then appeared a letter from a well known photographer who practised the process, saying that people ought not to look for definite toning formula, as every batch of paper they got hold of, would require a different bath, and all they had to do was to mix the solution of chloride of lime and some carbonate of lime, and chloride of gold together, and if they did not do, alter the proportions till they would; then use the bath as long as it answered, and when it ceased to do so begin again. This was very unsatisfactory, but strange to say, in the midst of all the letters containing the account of failure, were two which stated that the authors having exactly followed the directions given, had at once obtained good results. He (Mr. Heisch) happened to know the writers of these letters, and on questioning them as to their proceedings, the idea that he had previously entertained, that chloride of lime was a wrong basis for a bath, was fully confirmed. One told him that he *boiled* his bath with carbonate of lime till it did answer. The other, that he had bought his solution of chloride of lime ready made, and he remembered that it was two or three ounces left at the bottom of a large bottle standing on a shelf in the chemist's shop. Any chemist would at once see how much chloride of lime was likely to enter into either of these baths. A consideration of the nature of chloride of lime and of these facts, led him to the conclusion that this bath was in reality very much of a return to a form of bath much used in France, in which the principal ingredients were chloride of ammonium and chloride of gold. Many of the members were aware that what is called chloride of lime consists mainly of a mixture of chloride of calcium and hypochlorite of calcium in various proportions. A solution of this body speedily changes, and under the influence of light parts with its oxygen, and passes entirely into chloride of calcium, and that with great rapidity. Here was the secret of success; all, or very nearly all, the hypochlorite must be got rid of; why use it at all? He (Mr. Heisch) began with chloride of calcium in definite quantity, and at once obtained a good working bath, fit for immediate use, giving good results with every sample of good paper, no matter how prepared, and capable of always being made exactly alike.

The formula adopted was this:—

Dissolve 1 grain of chloride of gold in about 1 dram of water, add lime water till the solution just restores the blue colour to reddened litmus paper, dissolve 8 grains of chloride of calcium in about 5 oz. of water, (the salt should be quite dried, but not fused), stir in the solution of gold, and make up the whole to 8 oz. with distilled water. The print if made on paper containing a salt of barium, requires no over printing, if with salts of ammonium or sodium, very slight over printing was necessary. The advantages of the bath were that it contained nothing that had any tendency to soften the albumen on the paper, and that any desired tone might be obtained, there being no tendency to run to flatness, even in over-toning a faintly-printed proof. Mr. Heisch here referred to a picture of a baby, which though very lightly printed, was toned to a black colour without any loss of roundness. Thus it appeared that what was required in the toning bath, was a chloride of an alkali or alkaline earth in excess, beside a neutral chloride of gold. Does the nature of this chloride affect the tone? Chloride of sodium was substituted for chloride of calcium, the result was, that the prints passed at once to the blacker tones without going through the browner and warmer ones. Two proofs from the same negative, printed to an equal amount, and toned one in the chloride of calcium, the other in the chloride of sodium bath were exhibited to show this; a number of pictures toned to different colours, were also exhibited. Mr. Heisch remarked that these results were obtained nearly two years ago, and he was ashamed to say nothing but laziness had prevented their publication, but good came out of evil, as he could now lay the process before the society as a tried one, it having been worked exclusively for the time above mentioned, not only by himself, but in an establishment where many hundreds of prints were constantly produced. Paper prepared with all kinds of salts had been used, and always with good results. He intended to try various other chlorides, as those of barium, strontium, with the gold, as it would be interesting to note the different tones produced, it being a curious question what was the reason the colour should be affected at all by these additions. The same question might be asked with regard to the variation in colour produced by salting paper with barium, sodium, or ammonium salts. Here, without pretending to give a decided answer, a probable one suggested itself, viz., that, as in chloride of barium, 35·5 parts of chlorine were united with 68·6 parts of barium, while the same quantity united with only 18 of ammonia, the chloride of silver precipitated on paper prepared with the one salt, must be in a very different state of division to that precipitated on paper prepared with the other. It is well known that the state of division materially affects the colour of bodies; might not also the fact that prints on barium paper lose much less in the hyposulphite of soda bath, be accounted for in the same way? If the particles were more finely divided, they would be more perfectly acted on by the light, and less undecomposed chloride be left to be dissolved. Might not the state of division, and consequently the colour of the gold deposit, be affected in some similar way by the salts with which it was combined?

Mr. Heisch called attention to the various colours of precipitated gold depending apparently entirely on its state of division, particularly noticing the beautiful red colour of light transmitted through the finely divided gold in suspension, precipitated by Mr. Faraday's method with solution of phosphorus. Mr. Heisch remarked that some might think, a minute quantity of hypochlorite of lime in the toning bath, would serve to clean the whites of a picture. This was only necessary when the proof had become discoloured in the printing frame, and as the finer half tones suffered at the same time, over printing became necessary, to which Mr. Heisch had a great objection. In conclusion, Mr. Heisch said, that some time after he had made his experiments, Mr. Mayall seemed to have arrived at a similar conclusion, as he recommended making a solution of gold with a large excess of acid, neutralizing it with carbonate of lime, and diluting to make the toning bath. He (Mr. Heisch) however preferred taking a definite quantity of ready prepared chloride of calcium, as much more certainty could in this way be obtained. In reply to a question of one of the members, Mr. Heisch said he prefered using the bath when it had been mixed about ten minutes, but it could be used the next day. If it were not exhausted by one batch of prints, the best way was to put in a drop or two of acid, just enough to make the solution redden litmus paper, and neutralize it with lime water when it was again wanted for use.

After a short discussion, Mr. Heisch again rose and said he must apologize for again addressing the society on this evening, but he wished to bring before them a fact in connection with a subject which, though not strictly photographic, was interesting to photographers as bearing on a question which had lately excited much discussion. They would all remember the Chimenti pictures, which were by some thought to be true stereoscopic pictures drawn expressly to produce an effect of relief, whilst others maintained that such relief as they did exhibit was the result of accidental differences in two copies of the same picture intended to be alike. The advocates of the former theory maintained that it was impossible to produce such an effect accidentally. Mr. Heisch thought he could show them that not only such an amount of stereoscopic effect, but a much more perfect one could be produced by the purest accident. In "Poggendorff's Annalen," for February last, a method was published of artificially producing the phenomenon of asterism as seen in mica and some other bodies. This consisted in producing a number of fine scratches on a piece of glass of any regular figure, by drawing it over a piece of fine sand-paper in directions parallel to each of its sides. When a spot of light viewed through such a piece of glass the star-like appearance known as asterism was seen, the number of rays to the star being double that of the directions in which scratches were made. Having prepared two such glasses with nine sides, each of which gave an eighteen-rayed star, he was surprised on putting one to each eye to find that all the rays (which, when viewed with one eye, appeared to spread out flat from the light) seemed to turn towards him, forming a hollow cone, of which the light was the apex, the rays appearing to pierce through all intervening objects. On turning one of the glasses round, some of the rays still seemed to approach him, while others turned in the opposite direction, and apparently went through the wall of the room, but in no position, except the one first accidentally tried, did all the rays turn in the same direction, making a perfect hollow cone. He could only ascribe this effect to the fact that there were slight accidental differences in the direction of the scratches, which served to make the two stars just differ from one another, in the same way as the well-known outlines of a hollow cone, which were among the first stereoscopic pictures published. In this view he was confirmed by many scientific men, to whom he had shown these glasses. Mr. Heisch then exhibited the glasses to the meeting, he also showed one of the instruments now being sold under the name of asterscopes, in which the effect is produced by ruling lines on a piece of glass with a diamond point at regular distances. In these, the starlike appearance is very perfect, and the rays are beautifully fringed with prismatic colours.

After the usual votes of thanks, the meeting adjourned.

Photographic Society of Scotland.

The second monthly meeting of this Society for the winter was held at Edinburgh, on Tuesday evening, 13th December, Principal Sir **David Brewster**, Chairman, presiding. There was a large attendance.

Mr. **John Pouncy**, of Dorchester, read a paper descriptive of his process of carbon printing. (see p. 18), and showed a large variety of fine specimens. Mr. Pouncy concluded his paper, which met with frequent applause, by mentioning that in passing through Liverpool, on his way to Edinburgh, he met a very energetic persevering man, named Mr. Forrest, a glass stainer, who told him that a friend had called on him a few days before, and shown him a picture burnt into opal glass. Mr. Forrest sent for the picture which his friend said was a carbon photograph transferred to the opal, and then glazed and burnt in. When questioned further the latter said it was a modification of Mr. Pouncy's process, and Mr. Swan's, but he would not at present give further details. Mr. Forrest had an idea that it was a carbon photograph, but an operative in the potteries had asserted that carbon would not stand fire, but would all go off in carbonic acid gas. It was in point of fact, he believed, a photograph produced in ceramic colours, which was transferred to the opal glass, and therefore it stood the fire.

The lecture was illustrated with frequent experiments.

Professor Moir said, The President has called on me to express an opinion on this paper, which as a mere layman in the art of photography, I am hardly competant to do; but I think I may venture to express the opinion of the whole meeting, when I say that it is their wish that the President should convey the thanks of the meeting to Mr. Pouncy for the very instructive and interesting paper which he has now read. All who have practised, or like me, dabbled in the art of photography, know the uncertainty and capriciousness of the printing process, how sometimes a print on which you have bestowed great care fades, and another, on which you have bestowed little care, is found after all to be untouched. The general result is, that we know nothing certain at this moment with regard to the printing process by silver. At the same time I suppose we may hold that we are now in the way of obtaining permanent silver prints, because I think the whole results of our experiments lately has been, that with proper care, you may secure tolerable permanency in our silver prints. But still it is an immense advantage to be enabled to fall back on a process which promises, and, I suppose, really performs, permanency. I do not know a more disagreeable thing than to go back and look at your old prints on which you have bestowed great care, and find that they have faded, or are fading; but if we can get a process which secures permanency, and, at the same time, brilliancy of effects, I think that is one of the greatest boons to the photographic artist. But I should have cared very little for Mr. Pouncy's process had it merely given us permanency. I think no one who has seen his best pictures, or has witnessed his experiments to-night, can entertain the least doubt that, in addition to all permanency, he also gives brilliancy of effect. Permanency is a relative term, and if Mr. Pouncy can secure as great permanency as printer's ink, I think none of us are likely to carry our views much further, and I believe his process in that respect is likely to realize all he has promised. He has shown us the application of his process in different ways; but while I am not competent to speak upon them, I think he has thrown out very interesting hints; and a man of his energy and perseverance in face of strong difficulties will, I have no doubt, work many of these things out to an efficient result. But, in the meantime, it is enough for us that he has shown us how to secure a reasonable amount of permanency, and given us prints to which no one can object, because, in truth, the best of them are quite equal to the silver process; I therefore move that a vote of thanks be conveyed to Mr. Pouncy through the Chairman.

Mr. **Kinnear** seconded the motion, and congratulated Mr. Pouncy on the great progress he had made; his pictures now being infinitely superior to those he had produced a few years ago, and indeed many of them nearly as good, and some of them quite as good, as silver prints.

Sir **David Brewster**, addressing Mr. Pouncy said: I have much pleasure in conveying the thanks of the meeting to you for your valuable and instructive communication; one of the most important that has ever been submitted to this society.

Mr. **Pouncy** returned thanks, remarking that, while he had not been at all times treated fairly by some societies, he never had had reason to complain of the Scotland Society.

Pantascopic Camera.—Mr. **Johnston** then exhibited, and read a paper descriptive of, a small camera, sent down by the London Pantascopic Company, along with a beautiful collection of panoramic views, taken on the Thames by this camera, and others of larger size on the same principle. The camera was examined with great interest, and the views were greatly admired.

On the motion of Professor Moir, a vote of thanks was given to Sir David Brewster for presiding.

Correspondence.

PHOTOGRAPHY IN GERMANY.

Berlin University, January 9, 1865.

The **Wothlytype Process** has been very often an object of discussion in our photographic society, and there are some very important points developed in the discussion.

The prints presented by Mr. Wothly to our society, are very excellent; they are finer than the best silver prints in certain points, but, in the deepest shadows want the details. It is the opinion of our best photographers, that in the Wothlytype process, the prints are not so fine in the shadows, as in the ordinary silver process. It is a very important fact, that Mr. Wothly had only given large prints as proofs for his process, but never, or very seldom, proofs in carte de visite size. Why not? I have requested Mr. Wothly to give me some Wothlytypes in carte de visite size, and received some proofs, but they are not by far so fine as the large prints from him, or ordinary silver prints.*

One other point, is the fading of some Wothlytype prints first remarked by Mr. Schlater, a member of our society, and afterwards by some other members, of the Wothlytypes in our collection. There are some here which have changed from a very fine tone to a peculiar yellow in the white parts. Mr. Carey Lea, who has written to me during the last month, remarks on this point, that the uranium salts have a great tendency to remain in the tissue of the paper, and that this is the reason of the fading or discolouring.

A third point is the fact, that, for the Wothlytype process, it is necessary to have dense negatives, the negatives that are good for silver printing are too thin for the Wothlytype process in most cases. That is a fact very important, for all photographers who have a great number of valuable negatives, for example, our Schauer or your Robinson, &c.

The last point is the price. There are, in the old printing process, albumen paper, silver salts; in the new process, arrowroot paper, collodion, uranium salts, and a little silver, which is not important, the other materials are the same. It is very probable that the price of collodion and uranium salts are not less than the price of silver salts, for the same amount of sheets, and the paper is only a little cheaper than the albumen paper. Perhaps it is possible to remove the imperfections of the process, and I hope it with all my heart, but there are still some objections, which I cannot refute.

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* The portrait of Mr. Wothly himself, in carte de visite size, which I have received from him, is an ordinary silver print.

A new method of washing prints perfectly, so that chemical agents are not able to discover a trace of hyposulphite of soda in the washed prints, is announced by Dr. Reissig, in Darmstadt. The method is still a secret, but there are some eminent chemists and photographers who have tried it with great success, viz., Professor Carius, Buchner, M. Schrank, Angerer, Wasselsky, &c.

M. Korn, photolithographer, who is working with Mr. Osborne's process, has produced photolithographic prints, with very good half-tones, from negatives taken from geographical maps. He intends to publish shortly a collection of cheap photolithographic maps for use in schools.

Professor Gerlach, a skilful amateur in photography, has employed Mr. Swan's printing process for producing images of anatomical objects in the natural colours. He employs for pigments the red ammonia salt of carminic acid. Some of these prints he has presented to the Berlin Academie of Science. In a short time I shall send you a description of my new and very simple method of testing photographic silver solutions.

Our photographic society intend to arrange, in the month of May, an international photographic exhibition. In their exhibition will be admitted photographs, photolithographic prints, and productions of similar processes, &c., specimens of application of photography in all branches of art, industry, and science, photographic apparatus, literature, &c., &c.

We hope to see, on this first international photographic exhibition in Germany, the best English photographs, and beg you to recommend this exhibition to your countrymen.

The exhibition will be opened on the 15th May, and close on the 15th July. The exhibitors are requested to announce the objects of exhibition, with a description (size, &c.) by the 4th April, to the Member of Committee, Mr. Beyrich, 101, Fredrick Street, Berlin, and to send the objects to the same address till the 5th May. Messrs. Trübner & Co. 20, St. Dunstan's Hill, London, will be kind enough to accept all the objects of exhibition for sending here.—I remain, yours faithfully, DR. HERMANN VOGEL.

COPYRIGHT IN ENGRAVINGS, *versus* "PIRACY."

SIR,—I have perused with great pleasure your recent remarks, on an article (copied from the *Standard*) which assumed that those who photograph and sell copies of engravings do so in violation of law and justice, and to the great injury of that artistic body who produce engravings at great cost, only to see them appropriated by others, without compensation or the means of enforcing it.

Such an appeal goes straight to an Englishman's love of fair play; and is calculated, with superficial readers, to produce an impression unjust towards photographers. But investigation of the matter in a light thrown upon it by the well-known practice of engraving-publishers reveals far different features. It is then seen, that those who now cry out against photographic infraction of protective law, were themselves the first to disregard existing legal protection afforded to their works; and that, not accidentally, but deliberately and of set purpose, for the sake of enormous extra gain.

Copyright for engravings was first granted by the legislature (8 Geo. II. c. 13) on this basis—It is right and proper that a producer, whether by his own genius or employing the genius of others, should be protected from dishonest appropriation of his work by mere copyists; but it is equally right and proper, on public behalf, that such virtual monopoly should cease at a given time. Sufficient interval, therefore, was given (twenty-eight years), wherein the producer should gather his harvest. But another clause was necessary, on behalf of the public, against the protected producer: and, with a sympathetic leaning towards art and its exponents, the legislature laid on them no heavy yoke. It simply said, "As you value these works highly enough to ask for their protection—as you call for pains and penalties on their infraction—you must take care to let it be known they are yours, and so warn off trespassers. Your name, and the period from whence your twenty-eight years of copyright date, shall be affixed to every copy of your works, so that no one may be able to say they sin against you ignorantly."

If for "engravings" we substitute "books," the matter has a clear parallel in a form more readily appreciable. What publisher in "the Row" would issue a costly work with a perfectly blank title-page, and yet deem his copyright secure? Would not such issue be held to indicate one or both of two things—complete recklessness of the property's value, or, some cogent reason for keeping the proprietorship secret? As the legislature found it necessary to regulate books, by compelling their recognition at the hands of publishers, in order to avoid social or popular evil, so also with engravings.

This bargain between the legislature (for the people) and print-publishers (for themselves) being concluded, the latter went to work; and soon found noble reward, in an appreciation of their skill which culminated in a *furore* for the best and earliest impressions of their plates. Here came their temptation. By issuing prints so soon as a plate left the great artist's hands, and before it had the name and date affixed by an inferior workman, enormous additions to the publishing price could be obtained; and the proof that such impressions were "virgin" consisted in the very fact which forfeited their claim to copyright—viz., the absence of any name and date by which they could be identified in point of age or ownership. But the premium was great: the usual temptation whisper, "No one will know," was very sweet; and, with minds balancing the *quid pro quo* of ruined protection against fortunes gained by a *coup de main*, they chose the latter: and, *did* get the fortunes.

Research would reveal strange facts regarding these unlettered proofs. In some cases, their number was so great, that purchasers of ordinary copies only obtained impressions from an old plate. In others, by covering the lettered portion of the plate, sham impressions without any lines were produced, and sold as veritable proofs taken in the virgin state of the plate! Of course, this is chargeable only upon dishonest dealers. The fact, however, of enormous issues of unlettered proofs at high prices is beyond dispute.

Well and good—a fair market and equitable sale: a mess of rich pottage for a forsaken birthright. But, lo! "while their meat was yet in their mouths," other art-students announced, in joyful "Eureka!" the birth of a process whose wondrous beauties eclipsed even those of line, mezzo-, and aqua-tint—diverted all eyes, won all hearts, opened up another temptation to those who had but recently succumbed to a former one. "Whether 'twere better" to recognize the new art, and, by securing its services, discount opposition? or, boldly ignore the violation of their legal bargain, assert the continuance of unimpaired copyright, and strive by any means to slay the young Hercules, should he approach the fair fields they had lain so invitingly open? These were the two positions offered to print-publishers for choice.

Their decision is well known. Few photographers have not heard of The Printsellers' Association and its fulminations of "anathema, maranatha:" its Bull against "piracy"—its threats of Chancery and Common Law—its raid against the spinsters or widows of cheap stationery, berlin work, and fancy goods depôts. Offers of royalty upon photographs of engravings were rejected; and, with the finest material in their hands for producing what the nation called aloud for, viz., cheap photographs of engravings, print-publishers preferred to stand by their order, and rather threaten back the advancing tide than sail on it to fresh fortune.

As a matter of private decision upon private property, of course they had a right to do as they chose; as threateners of pains and penalties for the infraction of legally protected productions, they would be justified, albeit their proceedings savoured strongly of merciless extinguishment of a process which advertised their works rather than usurped them; but, as persistent maintainers of copyrights already broken by themselves, their conduct requires grave justification instead of appeals for help and sympathy against "piracy."

But how if that ugly word may be retorted upon those who affix its stigma to others? And is it not "piracy" to sail under false colours—to arrest traffic on the high seas of commerce—and, by the force of terrorism, prey upon those whose fears and ignorance make them a ready prey?

Has all this been done? Yes; or, why the enormous prices given in buying those prints whose existence completely negatives the claims urged for damages through photographic infraction of their copyright? "Peace" and "War," unlettered, have sold for £16; "Highland Nurses," for £20. A bill of sale, dated 30th Sept., 1861, and filed in the Queen's Bench Office on October 19, 1861, recites that "there have been struck off or printed 1803 impressions, *besides etchings and working proofs*, from the plate of 'Eastward, ho!' viz., 650 artist's proofs, 150 proofs before letters, 403 proofs after letters, and 606 prints; and that they (the proprietors of the plate) have sold 1,167 impressions; viz., 220 *artist's proofs*, 63 proofs before letters, 278 proofs after letters, and 606 prints." The scheduled prices of sale are quoted at—"Artist's proofs, twelve guineas; proofs before letters, eight guineas; proofs after letters, five guineas; prints, three guineas." 650 artist's proofs, to but 606 ordinary prints!

But the issue of unlettered proofs has been sought to be explained away. One of the most eminent print-publishers thus defends it, *on affidavit*:—"Up to within the last few years, it was the unvarying and universal custom in the trade to strike off a *few working proofs* of engravings for the inspection of the engraver of the plate and of the publisher, for approval, before either proofs or prints were struck off; and the publication line, or words stating the name of the publisher, his address, and the date of the publication, were never added until *after* the approval by the artist and publisher of the working proofs submitted to them."

The best reply to this is the legal document just quoted, which recites, "*besides* etchings and working proofs," the issue of 650 artist's proofs!

Plenty more evidence, however, exists, in disproof. At a recent auction of fine engravings, by Messrs. Christie and Manson (Dec. 13—16), 29 were sold, not only quite unlettered, but with the *stamp of the Printsellers' Association* affixed in warranty of their completeness; and, in some cases, the autograph of the engraver! If mere "working proofs," whence these signs and seals? Why on *sale*, and that at prices trebling ordinary rates? A good proportion of the 29 so sold *are the claimed copyrights of the author of the affidavit!*

Other instances of "unlettered" sales—the very articles themselves, on one hand; and written applications for damages through sale of their photographic copies, on the other—can be produced, and may yet be produced, to show where "piracy" really lies.

Not only in the *entire* absence of "publication lines" has copyright been vitiated, but also in variations of their reading. Thus, one celebrated print has three publishers' names, but no proprietor; others are deficient in date; and the general custom evinces ignorance of business or wilful violation of its responsibility, either of which considerations is sufficient to forfeit protection. A further neglect, too, is found in the absence of formalities provided for the transfer of plates from one proprietor to another. Where a proper deed of transfer was required, receipts merely have been sometimes given; and yet men who would ridicule claiming property in land without its due conveyance, not only have bought unconveyed pictures, but stoutly assert indefeasibility in their title!

Another strong proof, though but an inferential one, of a bad cause, is found in the fact, that photographs of engravings have been and are openly sold by men of character and pecuniary weight, whose conviction and punishment could be easily secured if the claim of illegal trading were maintainable against them. As, too, the desire of repression is manifested by repeated threats against traders likely to throw "a sop to Cerberus" rather than enter upon litigation, the deduction is natural that no real claim is felt to exist, and that its mere shadow is dressed up as a raw head and bloody bones to frighten simple folk.

It is but justice to say, that of late certain engravings are sworn to have never been issued without complying with every legal requirement. Among them may be named "The Light of the World," "Horse Fair," "Midsummer Night's Dream," &c. But, in at least *one* notable law case, where plaintiffs at first denied that unlettered proofs had been issued by them, the existence of numbers was discovered, and possession of some obtained!

Where copyright really exists, its holders have been ready enough to vindicate it: the actions of "Gambart *v.* Ball," "Gambart v. Sclater," and "Graves *v.* Powell," with their result in favourable verdicts for the plaintiffs, are instances. They also prove, that where the owners of engravings have not themselves vitiated copyright, it stands intact and preservative against every foe who can be met and impounded: not only by expensive action in the superior courts, but by the simple process of a county court summons.

Those who reproduce such copyright prints must take the fair consequences; those dealers who buy them must also share in the odium and risk; but those who only copy or sell engravings rendered common property by the owners themselves, need fear no "piracy" nor "damages," if they will but be true enough to justice and themselves not to gave way to mere threats. Of the dignity, fairness, and ultimate consequences, of so asserting claims unmaintainable at law or equity, our courts of justice may soon express an opinion which will exhibit the matter in its true light; and, perhaps, inculcate the lesson that those who swear by the law shall be judged by the law—that they who seize the sword shall be slain by the sword.

A word or two may be advisable upon the Acts of Parliament referring to engravings. They are five, and date back to the days of Hogarth, for whose benefit the first (8 Geo. II. cap. 13) was passed. It is not necessary here to analyze their character, which is difficult in some cases to determine. Great deficiency is generally acknowleged in their provision for recovery of damages; the nature of the subject being more intricate than usual, makes this especially apparent; their penal character renders literal interpretation necessary, and the whole require revision. However, as has been shown, they are clear enough to meet most cases where proprietors have properly studied their obligations.

The recent Act of 25 and 26 Vict. cap. 68, has nothing to do with the matter, but is confined to "paintings, drawings, and photographs," for which, its preamble recites, there was then "no copyright as by law established." Also, the Act only applies to productions *first* published since its coming into operation, and those only of the class described; engravings are not referred to. This Act, however, is enforcible by police jurisdiction, instead of civil process only.

Dealers in photographs who have not thoroughly studied the legal matter for themselves, should confine their purchases to issues made by respectable Houses, who have too much at stake to risk the reproduction of copyright pictures. The reckless reproduction (by some persons without status or scruple) of any engraving they can manage to get hold of has produced a natural feeling of exasperation among print-publishers; and against such peripatetic pirates a civil action is simply throwing money away, as they could pay no costs. This evil may be soon lessened by fresh legislation. If the Printsellers' Association confined itself to legitimate complaints of *this* grievance, they would be respected: but, instead, they have chosen to rush, headlong and apparently blindfold, against *all* photographic copies of their works; and, so culpably insulting those who have as great interest in the maintenance of copyright as themselves, they must not be surprised if they find they have grasped the sword by the wrong end, and so maim their own hands instead of injuring those whom they had selected for victims.—Yours obediently, Detector.

Talk in the Studio.

Photographs of Ancient Inscriptions in India.—Under the orders of Government, photographs are to be taken of all the ancient inscriptions in the province of Mysore. Some new light may thus be thrown on the ancient Jain empire, which is wrapped in so much mystery.

An "Infant's" Photographs.—At Judges' Chambers, a few days ago, before Mr. Justice Williams, application was made, on the part of the defendant, in a case, "Bracher *v.* Story," to remove a plaint in the Oxfordshire County Court into the Common Pleas, on the ground that a difficult question of law was likely to arise. Mr. Maynard applied, and Mr. Maddox showed cause. The plaintiff, it appeared, was a photographer at the University Rooms, Oxford, and the action was for nearly £30 for photographs. The defendant, a young gentleman, pleaded "infancy," and applied to remove the cause by certiorari. A point might arise whether there had been any ratification after the defendant came of age. The learned judge said that the question referred to could be tried before a county court judge, and he should be insulting a judge of such a court if he supposed such points could not be decided. Ultimately Mr. Justice Williams refused the application, it having been made too late.

Selling and Exhibiting Portraits as Specimens.—A case of some interest was recently tried in Brighton County Court. Messrs. Lombardi and Fox endeavoured to recover £2 of Mr. Hall for a portrait said to be sold to him for that sum. It appears that a colourist, Signor Monte, engaged by Mr. Hall, had retained one of the duplicate guides supplied with a print to be coloured, and having coloured the duplicate, sold it to plaintiffs, who exhibited it as a specimen. The friends of the original seeing the portrait exhibited in opposition to their expressed wish, complained to Mr. Hall, who endeavoured to obtain possession of the picture. From the evidence it appeared that, Mr. Pousty, assistant to Mr. Hall, called on plaintiffs with instructions either to see the picture destroyed, or to obtain possession of it. Plaintiffs demanded £2 for giving it up, and stated that Mr. Ponsty promised that Mr. Hall would pay that amount. This Mr. Pousty denied, and, after some contradictory evidence on this subject, a verdict was given for the defendant, apparently on the ground that the portrait ought never to have been in the possession of the plaintiffs. The system of buying portraits as specimens is certainly to be deprecated, as it is often a source of annoyance to those whose portraits are exhibited; and it is, in any case, misleading the public who believe that the specimens are the work of the photographer at whose establishment they are exhibited.

To Correspondents.

L Dolibo.—All the engravings you mention are, we believe, old ones, in which there is no copyright. We do not know of any photographs of them having been published or registered; but even if they had been copied and registered, that would be no barrier to your right to copy them if you wish.

Alexander Arnstein.—We will take an early opportunity of trying the process, and will then report upon it.

W. W.—When you speak of a "small positive picture," do you mean a positive on glass or paper? We suspect from your remarks you mean the former, in which case you should have described the appearance which you describe as fading. It is probable that it is rather the discolouration of the silver deposit by the atmosphere. This may be removed by a solution of cyanide, but it requires very great care not to dissolve the image or injure the film. We have at times completely restored discoloured collodion positives, but we repeat great care and judgment are necessary.

J. Clarke.—Our Almanac was published on the 2nd of January; but during the first two or three days the demand was greater than the binders could supply. There is no reason why you should have had to wait after the 5th.

Walter Jessop.—We were some years ago very familiar with the orange coloured deposit on the shadows occurring whilst intensifying, of which you speak, and then thoroughly investigated it. You will find the subject treated at length on p. 361 of our sixth volume, and also more concisely in our last and present Year-Book. We cannot enter into the subject at length here; but may mention that when the tendency is present, the application to the film, prior to intensifying, of a solution of iodine 1 grain, iodide of potassium 2 grains, in an ounce of water, is generally a certain remedy. The free use of citric acid in the pyro solution is also often useful. When the deposit is there, the best plan is to treat the plate with a dilute solution of bichloride of mercury. This will turn the copper-coloured deposit white, so that it will scarcely interfere with printing.

East.—The spot to which you refer is an iron spot in the paper. 2. Your old collodion may possibly be occasionally mixed off with new for purposes where great rapidity is not required: or it may be used to clean plates. 3. The front lens of a quarter plate combination will probably give you views of about 6 by 5, but not 12 by 10, or anything like it. 4. The print you enclose is wanting in general sharpness; but the hand of which you complain is in the worst position possible for securing definition; it is just in the middle of the picture, and more advanced than any other object. In arranging your subject to favour your lens, central objects should be a little the furthest from the lens. Your lens is probably wanting in depth of focus, and you have used it without a stop. The lighting has nothing to do with the definition here; although bad lighting sometimes yields results resembling bad definition.

Medicus.—We have given several formulæ for lime toning baths in the News, all of which will give good black tones: but we do not know to which especial one you refer. It is probable, however, from your description of the difficulties you experience, and the grey tone you describe as resulting from your toning bath, that the fault is chiefly with your negatives; unless they are sufficiently intense in the lights, and clear in the shadows to permit of deep printing, it will be impossible to get a black tone by any toning bath. A deep deposit of silver in the shadows is absolutely necessary to a deep tone, whether of purple, brown, or black.

T. J.—The size of condenser depends on circumstances. The usual size employed with Woodward's solar camera is of about 9 inches, and 18 inches focus, the form plano-convex. With a larger-sized condenser the exposure would be shortened. We cannot tell you the cost of a condenser Made by a good English optician, it would be very expensive; but we believe that condensers of French make, about the size we have named, may be purchased for less than £2, but we cannot tell you where. 2. We do not see any essential difference between that of M. Liebert and Mr. Stuart's, described in our 7th volume, whose pictures were amongst the best we have seen. We cannot tell you which would be least costly or least difficult to make. Read the articles in our last volume on Dr. Van Monckhoven's improvement on the solar camera. 3. Either the triple or the portrait lens of the maker you name will answer well, but we should prefer the triple for enlarging.

D. Gallois.—Yes; you may mix the hypo and sulphocyanide solutions for precipitation of the silver by means of copper. 2. A toning bath of chloride of gold and sulphocyanide of ammonium may be mixed and used at once. The gold solution which has been neutralized with carbonate of lime is quite suitable for the purpose. 3. We prefer, for general purposes, No. 2, and pre-eminently for buildings.

W. C. B.—The loosening and wrinkling of the film of which you complain is much more common with some samples of collodion than others, and when it is as bad as the example you forward, we should say a preliminary coating either of gelatine or india-rubber is the only cure. Moistening before development, with a mixture of alcohol and water, instead of water alone, is often valuable. As regards rapidity, the tannin process with ordinary acid development is not rapid; but if you desire shorter exposures the method of alkaline development will help you. 2. The singular zigzag stains of metallic silver in wet plates are very troublesome, and the cause not always easy to determine. They are more frequent with some samples of collodion and in certain conditions of the bath than others. A collodion which repels the bath and has a tendency to cause the solution to run in greasy-looking streams over the film, is often subject to this trouble. Keeping the plate long out of the bath conduces to this defect, especially if the drainings of nitrate of silver come into contact with a dirty inner frame. Keeping the frame quite dry and clean, allowing the plate to rest on clean pieces of blotting paper, and developing as soon after the plate has left the bath as possible, are amongst the best remedies.

W. H. Warner.—We shall be glad to see more of your experimental results in carbon and in uranium printing. The ruby tint we find peculiar to some samples of collodion; but we have generally found that the addition of more nitrate of silver was the best means of securing a deeper tone. In some cases the prints which, in the first instance, toned purple, were changed, by continued action of the gold and sulphocyanide bath, to a ruby tint. In our process with chloride of silver in collodion, which you are pleased to call the "Simpsontype" (our own modesty and the ugliness of the word make us hesitate to adopt the name), we find it easy to obtain any tone. Thank you. Our publisher has sent the Year-Book.

N.—The ball and socket stand is very excellent in principle, but we apprehend that with a heavy camera it would be difficult to secure absolute rigidity by the mere pressure of the screw upon the ball. We have not, however tested it, and can only suggest that Mr. Warner, as a practical photographer, had felt the necessity of such a stand as that he described, and had not found one in the market to meet the case. It is possible that he had not tried a ball and socket stand. We have not had sufficient experience in unusual or difficult positions to speak with confidence on the subject. You will see the discussion on the subject in the present number.

G. R. Gill.—You have obtained the result very cleverly. We should be glad to learn further particulars.

J. M. Burgess.—The further specimens you send are very fine indeed. We shall notice them in our next.

G. Restall.—Received. We shall be glad to hear further from you.

E. Aldis.—We shall be glad to hear the results of your further operations.

Several articles in type are again compelled to stand over to make way for current matter.

Several correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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COLLODIO-CHLORIDE OF SILVER—DISSOLVING NITRATE OF SILVER IN ALCOHOL.

From further experiment and from the testimony of various correspondents, we have reason to believe that our process of printing with chloride of silver in collodion will prove to be of considerable value and importance. Our esteemed contributor, the "Photographer's Assistant," speaks in high terms of the excellent results he has already obtained. The pictures he finds equal to those on albumenized paper, any amount of vigour can be obtained, the paper is twice as sensitive as albumenized paper sensitized in the ordinary way. Some of the examples he has sent us are perfect. He promises a communication on the subject shortly. Mr. Cooper, some details of whose mode of working with our process appear on another page, bears similar testimony, which isfully borne out by our own experiments.

Some of the facts we have met with whilst experimenting with this process are altogether unlooked for, and illustrate in a striking degree the colourific powers of finely-divided silver. In one case we obtained very sensitive paper, giving good results with a collodion containing half a grain of chloride of calcium and two grains of nitrate of silver in each ounce. From this it will be seen that a vigorous image may be obtained from a film of chloride of silver quite as attenuated as the film of nitrate of silver used in the uranium printing process, and at a cost very much smaller than that of the latter. The sensitiveness also appears greater, and the results more certain. The best results we have obtained from collodion containing 1 grain of chloride of strontium and 5 of nitrate of silver. We hope shortly to enter into further detail of the formulæ and manipulations.

In the meantime we have a few suggestions to offer on the best modes of dissolving nitrate of silver in collodion or alcohol, as required in several processes which are likely to become more or less popular.

The attempt to dissolve nitrate of silver by powdering it and adding to the collodion, is generally very unsatisfactory, as, after long standing and frequent agitation, very little often appears to have been dissolved; and as the use of a definite proportion is generally of importance any part remaining undissolved introduces an element of uncertainty into subsequent operations. The best plan is, therefore, to make an alcoholic solution of the nitrate of silver of a definite strength at the outset, the introduction of a measured quantity of which, into the collodion, would give the necessary result. In order, however, to obtain a solution of definite strength, it is important not to add more nitrate of silver than the alcohol will dissolve, as if any portion remain undissolved, the uncertainty we wish to avoid again results.

Nitrate of silver is said to be soluble to a slight extent in absolute alcohol: to what extent we are uncertain, as we have not tried it, but we believe it to be exceedingly small. It is, however, soluble in its own weight of water, and it would appear to follow that if a drachm of nitrate of silver were dissolved in a drachm of distilled water at 60 deg., and then added to seven drachms of absolute alcohol, the solution would be spirits of wine with a specific gravity of ·828, which is a little stronger than ordinary rectified spirits, containing sixty grains of nitrate of silver. But although this result might be naturally expected, according to our experience, it would not follow. A somewhat singular physical law seems to come into operation, by which the water, in mixing with the alcohol seems to lose part of its solvent power; on adding a saturated aqueous solution of nitrate of silver to alcohol in this way, a portion of the salt will be precipitated and not subsequently redissolved. We have found it convenient, therefore, wherever we were desirous of using strong alcohol, to deal with weaker solutions. We have adopted two or three methods, each of which answers very well. Place twenty grains of nitrate of silver in mortar and pound it up with a drachm of distilled water, then place in a bottle, and add seven drachms of alcohol. We have used it of a specific gravity of ·802. The water thus added reduced the strength of the alcohol to about ·835, the usual specific gravity of rectified spirit. A convenient solution for those who have not absolute alcohol at hand is made as follows:—Place sixteen grains of nitrate of silver in a mortar and add a drachm or two of ordinary methylated spirit, which has usually a specific gravity of ·820 to ·825. After pounding the nitrate thoroughly, pour off the clear solution, and add a drachm or two more of the spirit, repeating the operation until an ounce is used; if necessary, add half a dozen minims of distilled water to rinse out the mortar, so as to secure every trace of the salt of silver, a point of great importance in dealing with minute proportions.

A drachm of this solution will contain two grains of nitrate of silver, sufficient for an ounce of uranized collodion in the Wothlytype process. In making collodion to contain chloride of silver, four or five drachms of this alcoholic solution may be taken, three drachms of ether, and five or six grains of a suitable cotton; two grains of chloride of calcium may then be dissolved in a drachm of alcohol, and added. This will decompose between five and six grains of the nitrate of silver, leaving sufficient excess of nitrate to print well.

Another plan is to make a very strong solution of nitrate of silver in water; we have used a 240-grain solution. Two minims of this contains 1 grain of nitrate of silver. By adding a few minims to an ounce of collodion, a definite quantity of nitrate of silver can be added without materially affecting the physical condition of the collodion; but if too much be added, the collodion will become glutinous and will reticulate.

Nitrate of uranium, if pure, is freely soluble in ether and alcohol; but every sample we have yet tried contained impurity, and we have found a white insoluble residue. One test of its purity is, dissolving without residue in ether, in which it may be dissolved to the extent of upwards of ninety grains per ounce, about half that quantity, or even less, being, however, sufficient in an ounce of collodion for printing purposes. It may be dissolved in the same manner as described above in dealing with nitrate of silver.

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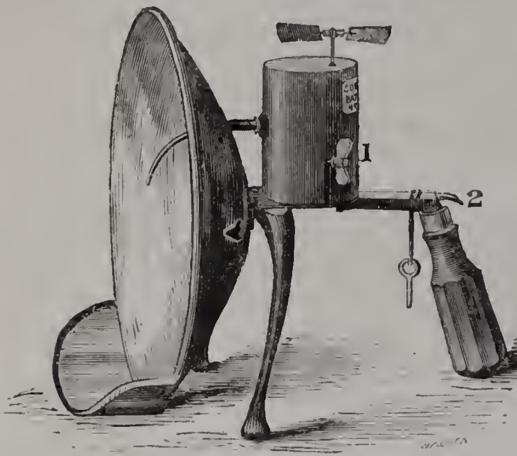
THE MAGNESIUM LIGHT.

MR. SOLOMON has called our attention to the recent improvements in Grant's lamp for burning magnesium wire, and to the various reflectors now supplied with it. Nothing can be simpler or more efficient than the lamp in its present form, which will be readily understood by a reference to the annexed diagram, which for the most part explains itself.



The small cylinder, marked 1, contains the clockwork arrangement by which the wire is steadily carried forward at a pace to suit the rate of combustion. In order to set it in motion, the small trigger, marked 2, is pressed; it may be either held down for a few seconds with the thumb, or kept down by inserting the small wedge which is hanging down beside the handle. At the top of the cylinder is seen a small fly, the angle at which the wings are set regulating the rate at which the wire is propelled. It may be held in the hand by the handle, or may rest on the table on its feet. In front is a concave reflector of an approximate parabolic form, in the focus of which the tube projects carrying the wire to be burned; a small pan at the bottom receives any ashes falling from the burnt wire. A cover with a glass front may be fitted on so as to protect the flame from wind. It is found that for portraits a light somewhat diffused is better than the strong direct light from the reflector. This is, therefore, made moveable, and a flat disc painted white substituted in its place. The lamps are made either to burn wire in two or three strands twisted together, or the flat ribbon into which it is pressed, and are throughout as neat, complete, and handy as can be desired.

Our readers are already tolerably familiar with the various purposes to which, in due time, the magnesium light may be applied; but we may here mention one special purpose, for it has recently proved signally useful. A *fac simile* copy of a will was required a short time ago, in hot haste; the time was short, and the need imperative: photography as a means of reproduction, naturally suggested itself. Application was made to the authorities at Doctors' Commons, for leave to photograph the will. The consent was given, but with a condition which appeared to render the consent nutgatory; the will could not be permitted to leave the office. The time was winter, the day dull; the hour late; the office dingy; photography, under such circumstances, was clearly impossible. The oxyhydrogen light was at once suggested as a means of overcoming the difficulty. But no explosive preparation of any kind could be for a moment permitted amid the important testamentary documents on which the tenure of half the property in the country might depend. The dilemma appeared without a solution. Fortunately, a bright idea occurred to one of those concerned; why not use the new rival of the sun, which had recently entered the lists? The question was no sooner asked than it received a practical answer. A lamp such as we have described above, was supplied by Mr. Solomon, and by means of the light furnished by three small wires twisted together, and the reflector above shown, an excellent negative was obtained in seven seconds. This is, we submit, a marvellous and satisfactory practical illustration of the value of the new source of actinism.[*]

For purposes like the above the price is moreover an unimportant consideration. In an ounce of the wire, there are, we believe about fifty yards of the thickness of that above referred to; this when twisted in three strands, would give about seventeen yards, and as one yard of three strands so twisted burns about three minutes, not more than an inch and a half would be employed in producing the negative of the document in question. The wire is retailed at about twenty-five shillings an ounce, and a very little calculation will enable the enquiring reader to arrive at the conclusion, that the cost of the light for a negative under such circumstances, would not exceed three farthings.

These calculations are based on data furnished by Mr. Solomon, who has taken up the subject with great spirit, resolved to furnish every aid which enterprize and ingenuity can supply to facilitate the introduction amongst photographers of the new light. We ought here to add one caution which Mr. Solomon suggested: namely, that the wire should not be burnt in any room where baths, or chemicals are exposed, as the products of combustion, although generally innocuous, are highly alkaline, and will therefore tend to fog—*verb. sap.*

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WILD BEASTS IN THE STEREOSCOPE.*

MR. HAES occupied himself during several months of last summer in securing perhaps the strangest portrait gallery ever produced by the camera. The results are now before us, in the shape of fifty-five stereograms of the denizens of the Zoological Gardens at Regent's Park, including wild animals of every kind—from the majestic lion to the timid sheep, from the swift antelope to the slow tortoise. No small amount of ingenuity and skill, an unbounded stock of patience, and some courage, were necessary, in combination with the best appliances, to do this work. It is not every man to whom, like Master Slender, it is "meat and drink to see the bear loose," and "take Sackerson by the chain." Most persons will agree with the women that they "cannot abide 'em; they are very ill-favoured, rough things." Mr. Haes has not, so far as we know, had to deal with bears or similar rough animals, loose; but he has had to enter the lions' den to secure a satisfactory portrait of his majesty; the excellence of the result, the public will doubtless think, well repaying the risk.

It is about twelve years, if we remember rightly, since Count de Montizon spent many months in securing some instantaneous photographs of the animals in the Zoological Gardens. The appliances of photography were not then in any respect as perfect as at the present day; but some very fine and interesting pictures were secured notwithstanding. It has often been matter of surprise to us since, that with the improved facilities of the art, no attempt was made to secure a complete series of the fine collection at Regent's Park.

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[*] Since writing the above, Mr. Blanchard has mentioned to us a case in which he recently found this light of essential service in obtaining a *post mortem* portrait necessary to be taken in a private house late on a dull day. We may also add that there is a probability of a speedy reduction in the price of the wire.—ED.

[†] A series of Stereograms of the Animals in the Zoological Gardens, photographed by Frank Haes. London: McLean and Haes, Haymarket.

So many things have suggested the commercial value of such a series: the curiosity and interest which almost all classes of society, young and old, lettered and unlearned, evince in wild animals; the natural and legitimate character of that curiosity and interest—for who can gaze on the rare beauty and symmetry of some; the indications of wondrous strength in others; the quaint oddity of others; the ceaseless pace and impatient unrest, offering a perpetual protest against their captivity; the far-off look of the eye disregarding everything around; the every look and action which proclaim them denizens of another kind of world, having no part in civilization; caged, but not subjugated; kept under, but not tamed—without a strange interest in creatures of such tremendous and ruthless power, capable, apparently, of being applied to so little purpose? Besides the mere elements of curiosity and interest—always items to be calculated in a commercial estimate of such schemes—such a series possesses a very high legitimate value as a source of instruction. We have never seen engravings in works on natural history in any degree comparable in force and truth to the pictures in the series before us. Being in the stereoscopic form, moreover, they afford opportunity for the fullest examination of their proportions, action, expression, &c., and will be invaluable to painters and sculptors who have occasion to depict such animals in their works. We congratulate all interested in such productions that the work waited for one who has as admirably carried it out as Mr. Haes, and we heartily congratulate that gentleman on the complete success of his arduous undertaking.

In an interesting paper, read by Mr. Haes at the last meeting of the Photographic Society, and reported at length in its *Journal*, he describes his operations, and the incidents that attended them, in securing the series before us. In the purely photographic part of the work there was no novelty; a rapid lens, bromo-iodized collodion, a 30-grain bath, iron developer, and pyro intensifier were used; and an average exposure of one-third of a second given.

Of the trouble involved in photographing these animals, some idea may be formed by the following description of the mode of securing the sable antelope:—

> Upon taking the camera to the sable antelope (of which the specimens in the gardens is the only living one ever seen in Europe, and which is so shy in its native Africa that a full-grown one is a prize which rarely falls to the gun of the most experienced sportsman), I saw I should have plenty of trouble; for as soon as he caught sight of the camera, he leaped up and butted at the rails furiously; the keeper said he would injure himself by his passion. So to accustom him to the instrument, I left it in front of his yard during several hours for two days. Even then he would stand looking at it, which position did not, of course, give a good view of the animal, and we fruitlessly tried many ways to induce him to present himself sideways to the lens. Fortunately the keeper noticed that it was attracted by a light-blue coat which I wore; and this was forthwith transferred to the back of a lad I had with me, and, whilst the antelope watched him standing as I placed him, I succeeded, after a week of attempts, in securing the required position.

One of the noblest pictures in the series, is that of the Lion, of whose head a fine, full-faced portrait is obtained. A grand and noble head truly; grim and saturnine, glancing with half-shut contemptuous eye on the proceedings. This is the lion which Sir Edwin Landseer has been modelling, how many years we are afraid to say, for the Nelson column supporters. Mr. Haes secured his portrait in eleven seconds. Of this and some animals of the same family Mr. Haes says:—

> With the noble specimen of the lion now in the gardens I had not much trouble; and, as you see from the photograph, on the suggestion of the keeper, I went into the den, which is double, with a sliding door, and, to a certain extent, managed to get a portrait which, I hope you will think, gives a fair idea of the grand head of a lion; the exposure for this picture was eleven seconds. The tiger is much more restless, and as yet I have only one negative of this handsome creature The Cheetah is comparatively tame, as the slight wires in front of his den show. This animal is in a room, and was readily induced by his keeper to give me a sitting.

The Cheetah forms one of the most successful pictures of the series, and might readily be supposed to have posed himself for the occasion. Mr. Haes does not report favourably of the wolves, one of which, of Tasmanian origin, made an attempt upon his legs; a similar attempt was made by the porcupine, but on the legs of the camera stand. The pachydermata were more troublesome than might have been expected; Mr. Haes says:—

> Many persons remark, "Of course you had no trouble with the elephant;" but they are indeed mistaken; this huge pachyderm is one of the most fidgetty animals in existence, and is perpetually moving trunk or legs. They have a curious habit of swinging the legs backwards and forwards; and the keeper who taught the animal to carry the saddle and to kneel when ordered, was baffled several times in his endeavours to make Jenny quiet; but she is certainly very sagacious. I used to feed her with apples, and she soon knew me well enough to go through the various performances at my command. Miss Bet, as the rhinoceros is familiarly called, is not a young lady of very great amiability of temper, especially since the arrival of the young rhinoceroses, who, she evidently fancies, are a counter-attraction to her charms. In fact, so uncertain is her temper that the keepers never venture into the yard when she is taking her daily constitutional. When she first saw the fresh arrivals, she was in such a passion that nobody knew how to calm her; and her strength is such as few can imagine. I found out that the rhinoceros could run at a good round pace when so minded; for one day walking with my camera covered with a bright yellow cloth over my shoulder, Miss Bet caught sight of it and charged full speed at me; fortunately the rails were between us. The little Babirussa had to be hunted from under his favourite heap of straw, and turned out into the yard, where we found him, like the curious masked pig of Japan, very restless, so that we adopted the same measures to get them quiet, namely, keeping them in motion for an hour at least, never allowing them to rest; and during the intense heat of Midsummer, this preliminary exercise was not much relished by us; neither did piggies seem to appreciate, wondering, I fancy, why they could not be left alone in peace. The Babirussa has very formidable tusks, and the injury he could inflict would be very serious.

The orang-outang furnishes an amusingly quaint portrait; posed with demure gravity on a chair, holding the hand of its keeper, it seems indeed a very close travesty of humanity. Mr. Haes gives some amusing details of the operation:—

> I must not forget to mention the orang-outang, which the society allowed to be removed from the monkey-house for the purpose of being photographed. Everybody in sight of course flocked round us at the novelty of Miss Susan taking a walk with her keeper; we put her on her favourite chair, and she sat (with that curious old-fashioned face of hers) looking at the crowd. After developing the negative, I sent a message to the keeper to come and see it, and he brought his charge with him; he looked at it, and then the orang quietly put its paw on my arm and drew it down, so that she could also see; it was indeed a grotesque parody. I can assure you that Susan gave me much less trouble than I have often experienced with Bi-mana of the genus Homo.

It would be a difficult and somewhat invidious task to single out of so many excellent pictures those which are best, as it is not improbable that some of those which cost most trouble may, after all, be least effective. Nevertheless, we may mention a few which strike us as especially pleasing as pictures and good as photographs. Amongst these are the buffalo, the Brahmin bull, and the yak; the zebra, who after some time since having taken lessons from Rarey, has since forgotten his good manners, is admirably posed and very effective. The seal is a capital picture; the tiger is grandly arranged, and is, as he lies, a fine embodiment of grace and power in repose. The ostrich is excellent, having carefully posed himself for a standing profile view. The eland makes a very fine picture, a vicious shyness in his expression is an admirable commentary on Mr. Haes's account of his intractable behaviour. The wild ass, the cameleopard, the camel, the dromedary, the kangaroo, the rhinoceros, the elephant, the water-hog, and the wombat, all please us much; but the whole series is valuable and interesting, and will, we trust, be as commercially successful as it is intrinsically valuable.

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Critical Notices.

VIEWS IN SWITZERLAND. Photographed by W. England. Dedicated to the Alpine Club.

"Peaks, passes, and glaciers" are the subjects of Mr. England's latest series of slides for the stereoscope. As with all Mr. England does in this branch of the photographic art, these are perfection. It would be useless to talk of the softness, delicacy, and brilliancy of every one of the pictures before us; every photographer who is acquainted with this gentleman's works is aware that they possess these qualities in a high degree, together with a high appreciation of the beautiful in choice of subject and point of sight. Another quality in which Mr. England excels, the want of facility in doing which often causes the ruin of otherwise charming views, is the judicious introduction of figures. In all the series before us we seldom find a figure out of place, and in the majority of instances they greatly assist in completing the pictorial effect of the composition. As an eminent example of this, we might mention "La Chapelle de Guillaume Tell," and the "Tunel sur la Nouvelle route de St. Gothard," in which the figures are very happily disposed, and in both of them the light and shade is exquisitely managed. In "Le Glacier et l'Aiguille de Géant Chamounix," "Les Grandes Pyramides sur la Mer de Glace," and "Les Grandes Crevasses sur la Mer de Glace," we are introduced to the "regions of thick-ribbed ice," and sitting by our own fireside can view the difficulties that attend the ascent of the giant mountains of Savoy. The "Gorge de Pfäfers" is an effective rendering of a very difficult subject; so dark that the glimpses of the sun only penetrate its depths for a few moments in the day, it must have opposed as many obstacles to the photographer as the interior of the dimmest cathedral. The "Pont du Millieu pres du found de la Crevasse, Via Mala," is a view of the same character.

Zurich and Lucerne have afforded some capital subjects. The "Panorama de Lucerne pres de la Cathedrale," is an excellent specimen of good composition, light and shade, and fitness for the stereoscope,—a point that is not always attained. "Le Quai de Lucerne" is full of figures, many in the act of walking briskly. In this view the sky is, we think, a little too dark, a fault that we notice in two or three others of this series; we abominate white skies, but it is possible to err in the other direction. The sky in the "Panorama de Lucerne," is also rather dark, but it is relieved by some picturesque clouds.

"Le Tunel du trou Perdu Pont Via Mala," The "Vue du Premier Pont Via Mala," and some others, are views of mountainous scenery, that might have been taken in Wales or Scotland, and are capital subjects for the stereoscope, and "La Chûte du Rhin Schaffhouse," represents quite a Niagara of a waterfall.

To go through this series in detail would be but to give a catalogue of very lovely pictures, with words of commendation to each; we will therefore conclude by pointing out the following as the very finest of this very fine collection; "Vue pris de Servoz," from the foreground to the distant snow-clad mountains, excellent, except that for once we find a figure in the way." Entrée de la Gorge de la Via Mala," with a fine breadth of light and shade. "Le Sommet du Mont Blanc ou de Servoz," and "Le Bristenstock et le Lac d'Uri Fluelen." We heartily congratulate Mr. England on the complete success of his second essay in depicting Alpine scenery, and hope for his series a very large success, assured that the wide circulation of such pictures, must tend to enhance the reputation of our art.

NORTH AMERICAN SCENERY; being Selections from C. J. Way's Studies, 1863-64. Photographed by W. Notman, Montreal. Royal folio.

Mr. Notman is a Canadian photographer, well known to his English brethren by the fine pictures he exhibited in the International Exhibition of 1862, many of which created surprise and admiration by the wonderful manner in which the effect of figures standing or walking in the snow was represented. He here presents us with a handsome folio volume containing a dozen copies of pictures representing passages in North American scenery by Mr. Way, and he has succeeded in producing a volume of reproductions that does justice to himself and to the paintings he has had to copy.

Few countries exceed in scenery of natural beauty the northern continent of America: forest and prairie, mountain and cataract, in almost every variety, and often possessing the most majestic grandeur, are there to tempt the pencil of the painter. Beautiful as are many of the photographic American landscapes we have seen, the very extent and grandeur of the subject often render it difficult for the photographer to vie in any measure with the painter in doing justice to this scenery. Mr. Way has been very happy in his selections, and successful in rendering them; the truth and minute detail of his work is such that some of the photographs might be readily supposed to be from nature. The views of Quebec and Montreal are of excellent quality. The views on the Saguenay are marvellously beautiful in the rendering of effects of water, atmosphere, and foliage. Altogether, this is an admirable selection, choice in subject, and successful in subject, and forming a very noble album.

Mr. Notman has also sent us a selection of his card pictures. We have rarely met more uniformly good photography, and, on the whole, pleasing arrangement. The fur-clad figures, with feet buried in snow—in the management of which Mr. Notman is so successful—are capital, and in perfect keeping throughout.

A series of instantaneous stereographs, chiefly consisting of views of the Falls of Niagara and the Rapids, present some wondrously fine effects. These are less successful in photography than some other of Mr. Notman's pictures of the same kind, but for grandeur and suggestiveness, we have not seen their equals.

INSTANTANEOUS VIEWS OF LIVERPOOL, and Views of RUFFORD OLD HALL. By Henry Sampson, Southport.

Mr. Sampson sent us, some time ago, a series of the most successful attempts we have ever seen to obtain instantaneous pictures on dry plates. The series now sent are, we presume, by the wet process, and are, in many respects, very successful. The view of "St. George's Dock" is a capital rendering of the forest of masts, so suggestive of enormous commerce. The "Custom House" is a good picture, as is also the "Landing Stage at Birkenhead," with approaching steamer. Some of the views are a little marred with white skies. The views of "Rufford Old Hall" are interesting as illustrating the wide angle which may be obtained with the stereo globe lens, in many cases three sides of a room being included. To secure crisp definition, a smaller stop should have been used, a certain amount of fuzziness prevailing wherever this lens is used with a large stop. The effect, in Lady Hesketh's private sitting room, of the window and dim rendering of distant foliage is very good.

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A HINT ON MASKS FOR DIAMOND CAMEOS.

BY V. BLANCHARD.

Those who have taken up the cameo portraits must have experienced, long ere this, a very considerable difficulty in getting the masks perfectly made. The plan recommended by Messrs. Window and Bridge is after all a somewhat roundabout one, and besides very difficult to carry out, for even with the steel plate, which they recommend, it would require considerable practice to cut out cleanly a perfect oval with a knife. The following simple plan will, however, completely get rid of the difficulty:—

Print lightly on any piece of waste sensitive paper a faint impression from the negative to be masked. The die should now be put in position in the press, and, if the latter have a flat table, two or three thicknesses of waste brown paper should be placed on it. The unfixed print abovenamed should now be placed on the table and the die lowered so as nearly to touch it, thereby enabling the operator to accurately adjust the oval die to the centre of the oval on the print. A very slight use of the lever will cleanly cut out the oval. Repeat the operation with the other three, and a perfect mask will be produced, for, of course, it will rapidly blacken in the sun and will be better, therefore, than black paper. I think much will be gained by the adoption of this method, for it frequently happens that the position of the head varies in different negatives; but by the plan any difficulty which would result from the employment of a mask with fixed distances, under such circumstances would be completely removed. Of course, by this method the oval opening and the embossed oval would be identical.

Should the embossing-press have a hole in the table to hold the counter die, some slight modification, such as a piece of hard wood or flat metal in the place of the counter will be needed; but, of course, this is a difficulty easily got over.

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ON THE USE OF CHLORIDE OF SILVER IN COLLODION.

BY H. COOPER, JUNR.

I have much pleasure in giving my experience in working with Mr. Simpson's process of printing with chloride of silver in collodion. I subjoin three formulæ. Any plain collodion, giving a tough and *transparent* film, may be used.

Add to each ounce four grains of chloride of magnesium, or an equivalent proportion of any other chloride soluble in alcohol. When perfectly dissolved, place in a mortar twenty grains of nitrate of silver for each ounce of collodion; pulverize and add one drop of water for each ten grains and half a drachm of alcohol.

As the atomic weights of chloride of magnesium and nitrate of silver are about as one to three, it is evident that twelve grains only of the nitrate of silver will be required to decompose the chloride in the collodion, leaving eight grains of free nitrate. When the nitrate of silver and alcohol have been well pounded together in the mortar; they must remain at rest for a minute or two to allow the undissolved nitrate to settle. Add the clear portion to the chlorized collodion, a few drops at the time, shaking between each addition; the collodion may now be poured into the mortar, the whole well mixed, and then returned to the bottle. After the sensitized collodion has stood for a day or two, to allow any undissolved particles of nitrate of silver to settle, it is ready for use. The collodion may be used upon plain photographic paper, but the results are much finer if the paper has been sized with albumen or arrowroot. Full details of my mode of sizing photographic paper with arrowroot were given in a paper read before the Photographic Society of London on Dec. 6th, 1864, to which I must refer my readers. The coating the paper with collodion is, after a little practice, a very simple affair. Overprint about as much as usual; wash first in distilled and then in common water. The prints may be toned by any of the usual methods, but I am inclined to give the preference to the following:—

Two solutions are to be made.

No. 1.

Water	20 oz.
Sulpho-cyanide of ammonia	2 ,,
Chloride of gold	2 to 3 gr.

No. 2.

Water	20 oz.
Sulpho-cyanide	4 ,,

The prints, after washing, are immersed in No. 1 till the required tone is obtained. They should be examined by transmitted light, as the tint seen upon looking *through them* is the one they will retain when finished. This viewing the prints by transmitted light is not so important when using the method of toning under consideration, as in the ordinary gold bath; it being imperatively necessary in the latter. The prints are now rinsed by passing through a dish of water, and placed in No. 2 for ten minutes. Or the order may be reversed, fixing with No. 2 and then toning with No. 1. The reason for using two baths of sulpho-cyanide will be obvious upon a little consideration. When the solution is nearly saturated with the silver salt, upon placing the print in water so as to dilute the solution clinging to it, sulpho-cyanide of silver is deposited in the print. This is removed by submitting the picture to the action of a fresh solution, which may be used for some time, as the quantity of sulpho-cyanide of silver to be dissolved is very small.

About three-quarters of an ounce of sulpho-cyanide of ammonia should be allowed for fixing the prints produced from an ounce of collodion; so that the toning bath of twenty ounces of solution may be used for three or four whole sheets of paper, in fact, till the gold is exhausted. The great advantage of the sulpho-cyanide over hypo is, that the former requires much less washing than the latter to eliminate it from the prints; and also that the solutions may be used over and over again without any danger of sulphur being liberated. The process just described with chlorized collodion is at present *practically* useful only to those who require a small number of prints, or to those who may wish to get a print from a negative without any of the preparatory trouble connected with the ordinary printing process. It has also another recommendation; that the proportions of sensitive salts on the surface of the paper can always be made the same, instead of their constantly varying as in the ordinary processes. A bottle of sensitized collodion can be prepared, which will keep for an indefinite period. The sized paper may be kept in stock, and the toning and fixing baths can also be ready mixed, as they will both remain in working order for some time. It will readily be seen that a print can be produced, without any bother, at a moment's notice. The second application is to photo-diaphanie.

In using the albumenized paper, prepared for that purpose by Harvey, Fowler, and Co., there are two great inconveniences to be overcome. The first is, that much over-printing is required, as the image is not entirely in the albumen film, but partly on the paper itself; this prevents many prints being got from a negative in a day.

The second arises from the same cause, it being very difficult to distinguish variations of tone in a print so dark, and even to know when it has been sufficiently over-printed.

The chlorized collodion removes both these difficulties; as the image is entirely in the collodion film.

This being the case, no more printing is required than for ordinary prints. But my readers must bear in mind that if the finished picture is intended to be viewed as a transparency, the print must be slightly darker than if seen by reflected light.

The only difference in manipulation is in the sizing of the paper. I find gelatine to answer best. The exact proportions to be used cannot be determined, as the quality of gelatines vary so much; however, the following will be a good guide. Fill a dish with a warm solution of gelatine, and float a sheet of photographic paper upon it for a minute and a half. If after drying, the paper possess a moderately glossy surface, we may conclude that the gelatine solution was of the proper strength. If *too much* gelatine be used, the collodion film will leave the paper before it is required to do so, and if *too little* it will take a long time in separating, or perhaps it will not come entirely away, only rising in blisters. The "happy medium," can only be determined by a few trials; as a great deal depends upon the quality of the paper and gelatine; and also upon the temperature at which the solution of the latter was used; about 120° is the most convenient. The collodion film should show no symptoms of leaving its paper support, until the print has been placed in the fixing solution; and should not come away entirely till it has been slightly washed. When a film appears to have a "lingering attachment" to the paper, it is as well to place the prints in warm water for a few minutes. This treatment will generally set all right. After washing, the collodion film may be caught upon glass or any other smooth article in the usual way.

The quality of the collodion is of more importance than for the first adaptation of the process, it being necessary that it be very tough and glassy. When these qualifications are secured, ordinary care only is required to prevent accidents to the film whilst washing and transferring.

There has been lately some little discussion on what has been called the "Toovytype," and it has appeared to me that, as practised, the process presents many points of difficulty which are removed by the following process with chlorized collodion:—

I myself prefer transferring the prints to the opal glass, instead of printing direct upon it, for this reason. It being extremely difficult to obtain opal plass perfectly level, there is great danger of breaking the negative or glass by pressing them into sufficiently close contact to ensure a sharp print; yet there may be some who have a desire to print direct upon the glass, and it is for their benefit that the few concluding remarks of this paper are intended.

Take three whites of eggs, place them in a bottle with one ounce of water, three drops of acetic acid, and three drops of carbolic acid.

The latter enables the albumen solution to be kept in good condition for some time. After well shaking, the bottle is placed to rest for about a week. The clear upper portion is decanted, and is now ready for use.

Clean a piece of opal glass and coat it with the albumen; a camel's-hair brush will be found of great assistance in leading the solution over the glass. When the plate is dry it is to be coated with the sensitized collodion, and when again dry may be placed in the printing-frame. The operations of washing, toning, and fixing are performed as in the two previous processes with chlorized collodion.

Since writing the foregoing article, I have been making some experiments to determine the smallest quantity of chloride and nitrate of silver that can be successfully used, and also to try and overcome a few manipulatory and mechanical troubles that I have met with. When I have concluded them, I shall be happy to give my readers the results; in the meantime, I would ask all those who have time for experiments, to work this process of Mr. Simpson's, as I feel tolerably certain that something good will come of it. It is the cleanest and most simple printing process with which I am acquainted; and for this reason I would recommend it to the ladies, as with a little, *a very little* care, black fingers and soiled dresses can be avoided. I wish that some one could hit upon a suitable name for the process. The proper one, "Simpsontype," is rejected by the inventor, and not very euphonious in itself.

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LINES IN THE DIRECTION OF THE DIP OF THE PLATE AND THEIR AVOIDANCE.

BY T. SEBASTIAN DAVIS.*

During the progress of some photographic work, in the early part of last season, I suddenly encountered an unwelcome apparition in the shape of strongly-marked lines upon the collodion negative in the direction of the dip of the plate. It happened in this, as in many other similar instances, that the critical examination for the existence of a particular defect, revealed its presence as more generally traceable than might otherwise have been expected. It must be remembered, moreover, that markings in the direction of the dip of the plate are far less apparent in those parts of a negative covered with strongly contrasted lights and shades, than upon an evenly-lighted and plain surface. The apparition for a time caused me considerable dismay, and it was only after the exercise of some patience and perseverance that I finally succeeded in exorcising it from my presence. Under these circumstances it may not be uninteresting to describe the various experiments I made during the struggle to remove my offensive visitant, and the means by which any of you may prevent a similar intrusion.

My attention was naturally directed in the outset to the condition of the bath, and to this more especially as the collodion employed was made according to a formula that I had used for some time previously with every satisfaction, and to which, as I supposed, I had rigidly adhered. The presence of a large quantity of ether and alcohol in the bath solution was naturally the first and most probable supposition that suggested itself. In order, therefore, to eliminate any excess of ether or alcohol, and also to remove any other probable impurity, the bath was submitted to a treatment that generally cures it of any trifling disease. In the first place it was treated with its own volume of water, and the precipitated iodide of silver separated, then made slightly alkaline, and "sunned," afterwards evaporated to a small bulk in order to remove the alcohol and ether, and then, having been made up to the right quantity with distilled water, a homeopathic dose of nitric acid was finally added. Notwithstanding, however, this systematic treatment, and although it worked excellently in every other respect, the plates sensitized therein still showed the existence of the dark lines in the direction of the dip as before. Thinking it, therefore, not altogether improbable that either an excess of alkaline and cadmium, nitrates or organic matter might yet be present, I made a new bath of pure nitrate of silver, and also obtained one already prepared for use from a leading photographic chemist. The defect, however, under consideration was still persistent, and in no case yielded to any amount of final washing before the introduction of the plate into the dark slide. The only diminution of the evil occurred when using a bath containing much less than the usual quantity of nitrate of silver in solution.

Finding that no decided success attended any alteration in the composition of the bath, I was led to the supposition, that the evil must originate from some incidental peculiarity in the composition of the collodion. To test this upon the sensitizing solution I iodized different samples of good plain collodion with pure iodides of cadmium, sodium, and magnesium respectively, instead of a combination of two in union with a bromide as previously employed. The result of separate trials with collodions so made showed that the apparition was not to be thus scared, and I only learned from the experiments that it paid a slight complimentary preference to that containing iodide of cadmium alone. The presence of bromides in the collodion was shown to be disconnected with the effect, and as I afterwards also found, the presence or absence of free iodine.

I had now, therefore, no alternative but to direct my attention to the composition of the plain collodion itself. The samples that I had been using in the foregoing experiments were made with a pyroxyline manufactured with acids at a medium temperature, and in such a state of dilution as to yield a film neither particularly powdery nor tenacious. I prepared, therefore, two fresh samples of opposite kinds; that is to say, the one made in acids diluted to an extreme degree, and the other in the strongest fluids compatible with the production of a soluble cotton. I had great expectations that I should be able to gain some manifest indication of the cause of the peculiarity; but great expectations in this as in some other instances were doomed to disappointment.

Finding, therefore, that collodion prepared with either kind of pyroxyline, exhibited the anomalous defect, I had now, as far as the composition of the bath and collodion were concerned, but one little expectation left, and that consisted in the examination of the characters of the alcohol and ether, and the proportions in which they were combined: but mystery became more mysterious when I found that no alteration in the proportionate quantities of the ether and alcohol, no substitution of methylated for non-methylated, hydrous for anhydrous spirit, &c., proved availing. Under these circumstances, I re-read a paper by Mr. Thomas, and the discussion thereupon by the members of the Photographic Society, in which the former suggests that lines in the direction of the plate, are produced by actinic light falling upon the collodion film before the bath solution freely flows over its surface. Although disinclined to believe in the correctness of the theory, I thought it worth while to prepare some plates in the presence of the smallest amount of non-actinic light possible, and even in darkness itself; but found, as I had expected, the defect produced in an equal degree as under ordinary conditions. Placing these facts together, I could not but consider that the effect complained of had occasionally presented itself to the notice of the most skilful photographers, and to the manufacturers of the best collodions, but that no efficient remedy for its avoidance had been suggested.

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* Read before the South London Photographic Society, January 12.

After making the various experiments as detailed, and some others that I need not specially describe, a scrupulous examination of thr plate before exposure led me to the conclusion that the lines of intensity are faintly visible before development under favourable circumstances of illumination. This I found to be the case upon taking a plate as ordinarily prepared, thoroughly washing it, and then submitting it to a critical examination with the light thrown thereupon at the best angle for the detection of the minutest markings. The question now naturally arose as to whether these lines are formed simultaneously with the first dip of the plate in the bath, gradually, or during the time of the repeated elevation and re-immersion of the film in the bath. To discover this, I introduced a plate into a glass bath, previously placed in the best position of dull daylight for detecting any visible change in its appearance. After the introduction of the plate into the silver solution placed in the position as described, I was enabled to detect a *gradual* formation of the lines complained of, and these increased to their greatest intensity in about three-quarters of a second. It is useless to say that I had now a clue to a method of manipulation by which their formation may be completely avoided.

This method consists in lifting the plate a few times in and out of the bath immediately after its first introduction therein. Subsequent trials of this manner of manipulation have proved that it is one which constitutes a perfect cure for the evil complaimed of, and that it is efficient under the most refractory conditions. I therefore recommend, contrary to general instructions, that the collodionized plate be lifted in and out of the nitrate of silver solution a few times immediately after its first immersion, and the result will be greater evenness of sensibility, a quicker preparation of the plate for the dark slide, and the avoidance of lines in the direction of the dip of the plate under circumstances otherwise favourable for their production.

COPYRIGHT IN ENGRAVINGS AND PHOTOGRAPHIC INFRINGEMENTS.

A case important to photographers and to print-publishers, which has been postponed from time to time, was heard last week before Vice-Chancellor Kindersley. It is interesting and gratifying to us to find that our statement of the law of this question was substantially the same as that given by the Vice-Chancellor, since photographers will read the details, with interest.

VICE-CHANCELLORS' COURTS, Jan. 13.

Before Vice-Chancellor Sir R. T. Kindersley.

LLOYDS *v.* ASHFORDS.

Mr. Glasse, Q.C., and Mr. Waller, moved in this case for an injunction to restrain the publication and sale of photographs taken from lithographs or chromolithographs of two pictures known as "The Onconvaniance of Single Life,—moral, never too late to mend," and "A Raal Convaniance; or, a wife able and willing to help a man when he's bothered." It appeared that the plaintiffs, who carry on business at 96, Gracechurch Street, having purchased the original oil paintings, got them lithographed for sale, and subsequently registered small photographs of the same. The defendants, who are photographic publishers in Newgate Street, purchased three of such lithographs without lines containing name and date, besides others which had, and caused photographs to be made from them. This fact coming to the plaintiffs' knowledge, they applied to the defendants, stating that they had a copyright in the prints, and demanding compensation for its infringement. The defendants, supposing plaintiffs' statement to be correct, and that they had been mistaken in deeming the prints open for use, offered £15 as compensation to avoid litigation, though professing to have made much less profit than that sum on the copies sold. This sum was, however, rejected by the plaintiffs; and soon after, the defendants having reason to think plaintiffs' claim invalid, withdrew their offer for compromise, and claimed a right to continue sale of their photographs. Hence, the filing of a bill by the plaintiffs, whose case was that the lithographs in question, although they might have formed part of a stock of prints sold for them by Messrs. Lewis, were only "artist's or specimen proofs," which, by the custom of the trade, were always first struck off to prove the complete state of the plate or stone, but that did not deprive them of their copyright, such proofs not being intentionally sold. The defendants, on the other hand, insisted that (although, no doubt, it had been the custom to strike off such proofs) they were not mere artists' proofs as alleged, but were an evasion of the Act of George II., and fetched a high price in the market, and the plaintiffs had lost their copyright. A good deal of evidence, by eminent printsellers and others, was produced, and the plaintiffs deposed that, in the present instance, only five or six artists' proofs had been struck off; whereas it was shown that, in one case of a valuable print issued by them, as many as 650 had been printed, in addition to etchings and working proofs.

Defendants also took exception to plaintiffs' copyright, on the grounds of an informal deed of transfer, and of there being no proprietor's name as well as publishers' names on the lithographs.

Mr. Baily, Q.C., and Mr. J. W. Hall opposed the motion on grounds already stated.

The Vice-Chancellor, without hearing a reply, said that, on the undertaking of the plaintiffs to answer damages, for the defendants' loss of sale, he would grant an interim injunction. There were several important questions which must be determined at the hearing; but at present the only question was, what was to be done in the meantime? Unquestionably the defendants had published photographs of lithographs made and issued by the plaintiffs; and if the plaintiffs had a copyright, the defendants had infringed it; but the defendants said, and his Honour did not mean to say untruly, that there was no such copyright, and, therefore, they had a right to make the photographs. This was founded on the contention that, by the 8th of George II., it was a condition of copyright that the name of the proprietor and the date of publication should be engraved on the plate, and printed on every print; and such name and date not being on these prints, the plaintiffs had no copyright. This contention depended upon circumstances, upon which the evidence was extremely incomplete. With respect to lithographs and engravings, it was well known that impressions were, during the progress of the preparation of the plate or stone, struck off from time to time to test its condition, for the satisfaction of the artist and engraver, and in order that, if necessary, alterations might be made, although, probably, not more than two or three such proofs were requisite; and these might be precisely the same as the proofs struck off for sale. Lithographs, like engravings, being subject to wear, the first would, no doubt, be superior. Whether working proofs could be taken of lithographs as well as engravings during the process of preparation, did not conclusively appear. The affidavits showed that drawings on lithographic stone were capable of improvement, although it was a difficult process. From the fastidious or morbid taste of connoisseurs, these specimen proofs were valuable, and no doubt it was interesting in the case of an eminent artist and engraver like Rembrandt, to watch, by the impressions taken off at various stages, how his mind was engaged. Taking advantage of this, engravers had been long in the habit of having artists' proofs struck off, 50, 100, or more, before putting the name and date, because it was a clear indication of earlier impressions. The plaintiffs said positively that they did not intentionally sell any artists' proofs before the name and date were affixed, but there was no positive evidence as to whether the prints in question were sold by Messrs. Lewis for them. Looking at the Act, his Honour might say this—that if an engraver intentionally struck off a number of artists' proofs after the plate was completed, but before the name and date were added, he would not acquire a copyright which the Act gave to those only who put the name and date on every print. But, where merely working proofs were taken, although the plate was complete, if they were not taken for the purpose of sale, he should say, that when they were accidentally sold, as was contended in this case, the plaintiffs would not lose the benefit of the Act in the acquisition of a copyright. On the question of proprietorship, that must be decided at the hearing; and on the question whether the defendants should continue to publish and sell, keeping an account, or whether an injunction should be granted on an undertaking as to damages, the latter must be preferred, because, keeping an account of mere number and price was no criterion of the damage accruing to the plaintiffs in case they were in the right.

At the suggestion of Mr. Bailey, Q.C., his Honour ordered that the term "piracies," as applied to defendants' photographs, should be withdrawn from the wording of the injunction, as defendants were evidently acting under a sense of right, and plaintiffs' counsel consented.

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Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held on the evening of Thursday, January 12th, the Rev. F. F. Statham, M.A., F.G.S., in the chair.

The minutes of a former meeting were read and confirmed.

Mr. WHARTON SIMPSON presented a copy of the YEAR-BOOK OF PHOTOGRAPHY for 1865 to the Society.

Mr. JOHNSON exhibited his pantascopic camera, explained its working, and showed a number of very fine specimens, including nearly 120°. After explaining that the pictures were in panoramic perspective, the image being similar to that projected on the interior of a cylinder, he deprecated any criticism on the pictures, which was based on the application of plain perspective to them. The questions whether persons preferred plain or panoramic perspective, was quite a distinct subject. These pictures simply claimed attention as panoramic pictures, produced on similar principles to that class of pictures which had been made famous by such men as Burford, Daguerre, and others.

The CHAIRMAN in proposing a vote of thanks to Mr. Johnson, expressed his great personal admiration of the pictures, many of which it was evident could not have been secured without this ingenious camera.

Mr. HOWARD, in expressing his admiration of the camera as a wonderfully ingenious invention, remarked that the idea of a camera in motion, almost horrified photographers, whose notions were all based upon the extreme importance of perfect rigidity. Some years ago he remembered that he made some attempts to secure panoramic effects by means of an ordinary stereo camera moving it round carefully after taking one view, so as to secure that adjoining it; but it was difficult to get anything like satisfactory results. Mr. Johnson's views were very fine, but it was difficult to conceive how a blurred image was avoided.

Mr. WARNER remarked that a fresh portion of the subject was constantly being taken, the same part was never before the lens twice.

Mr. MARTIN referring to the smaller pictures, remarked that they measured seven inches, which did not strike him as being so much more than was frequently obtained with ordinary lenses. Messrs. Horne & Thornthwaite a while ago, issued a lens which gave a picture measuring 7¼ inches on the base-line. Ross's doublet he believed, gave a picture of 8 inches on the base line.

Mr. SEBASTIAN DAVIS said it was less a question of the size of picture than of the actual amount of subject included, which in the picture before them was about 115°. In estimating the length of the picture it must be considered in relation to the focus of the lens. The lenses to which Mr. Martin referred were doubtless longer in focus than that with which Mr. Johnson had worked. He thought it would be an improvement if the pictures were a little deeper so as to include more sky. The most picturesque effect for landscapes was secured when the sky occupied twice as much space as the foreground.

Mr. JOHNSON said the pictures in question were taken with a Grubb's lens of 3¾ inches focus. Regarding Mr. Davis's suggestion they were about to adopt that plan, as might be seen from the camera back he produced, which would take a plate 7 inches deep, with the lens 5¾ inches focus.

Mr. HUGHES thought that in examining these pictures there was no necessity to raise the question of panoramic *versus* plain perspective. Each had merits of its own, and was not in antagonism to the other. Each could give effects which the other could not. They were constantly employing both systems, with the human eyes, and he saw no reason why photography should be limited to the use of one stationary eye. These gentlemen have supplied a power which photographers had always been longing for, and when attained some photographers suddenly discovered it to be full of defects. Photographers ought not to throw cold water upon such inventions. The photographs produced were, he thought, singularly successful. Of course, when a view of small angle were required there would be no necessity to use this camera. Its inventors introduced it very modestly; they had not, like another inventor of a similar thing, who, after saying that it was to supersede all other cameras, suddenly discovered the merits of flat plates when these gentlemen had shown how to use them. He thought that photographers ought to thank these gentlemen heartily for their admirable invention and the beautiful results they had produced.

After some further conversation,

Mr. ROWSELL exhibited an ingenious contrivance he had invented, called a "Graphioscope," the object of which was to obtain the best effect from a picture. It consisted of an easel for the photograph, and a magnifying lens through which to examine it. By a change in the arrangements, the whole could be converted into a convenient stereoscope. The instrument is manufactured by Marion and Co.

After some observations, and an examination with much interest of the instrument,

Mr. WARNER exhibited and explained his camera stand, described in our last.

After some conversation,

Mr. HUGHES said, that the first camera stand he ever saw possessed the iron straps which Mr. Warner had adopted, showing that there was nothing so new as that which was old. It was one brought by Mr. Mayall from America, the straps having been applied as the emergency suggested the necessity, when he was engaged in the trying and perilous experiment of photographing Niagara. The same thing was applied to various tent stands; to the stand of Edwards' model tent; to that of Mr. Thomas's ingenious box tent. It was clear that there was no novelty in that. In the upper part of Mr. Warner's stand he had adopted something like the French ball-and-socket system. He thought that a mixture of old things could scarcely be called new.

The CHAIRMAN thought the combination of various old things often was very valuable in forming one new one.

Mr. HOWARD thought that this and most stands were wanting in portability. The legs would be better if they each divided into two. He had one which had been with him over a great part of England and Wales, and in all kinds of dangerous positions. It was made of ordinary deal; each leg was in two pieces, the upper part fixing wedgewise into the lower; the stretching, in fixing to the tripod, serving to tighten the wedges.

Mr. HUGHES referred to a variation to the ordinary tripod head, which was very convenient. He had intended to describe it some time ago, and in the meantime Mr. Sutton had done so. It consisted in having in the three corners holes for a screw. The camera, thus resting on three screws, could be easily adjusted so as to be perfectly level, a thing he considered as of the utmost importance at all times.

After some further conversation, and a vote of thanks to Mr. Warner,

Mr. HART exhibited and described his apparatus for recovering silver from old hypo and other solutions, by means of electricity. After a vote of thanks,

Mr. HUGHES said of late years, especially since the introduction of the alkaline toning bath, photographers had been more careful to save the free nitrate of silver in their prints, which could be obtained as a chloride, but many neglected the large amount which might be obtained from the hypo-sulphate of soda. If he understood Mr. Hart rightly, he proposed to meet a want in this direction by providing a means of recovering the silver from the fixing solution, easily, neatly, and without the offensive smell of the method in which sulphides were used. It appeared that, instead of throwing the fixing solution into the sink—and he hoped that it was thrown aside daily by all conscientious photographers—they were to throw it into the jar, and next day have the silver for their trouble. Mr. Hart had provided what might almost be called an automatic means of saving the silver; which saved an operation which was a nuisance both to the photographer and his neighbours, as very few of them would sympathise with his efforts to save silver when they were accompanied by the horrible smell of the sulphides with which some of them were familiar. If, as Mr. Hart had stated, the chloride of zinc formed, might be used to remove any foul smell in the sewers, the photographer using the apparatus would be a benefactor instead of a nuisance to a neighbourhood.

Some conversation followed, in which Messrs. Hughes, Martin, Hart and Simpson took part. Mr. Hughes remarked that in Mr. England's practice, he recovered as much silver from the hypo solutions as from the washing waters.

Mr. **Howard** said he hoped this apparatus would be considered henceforth a necessary part of a photographer's *fixings*.

Mr. **Sebastian Davis** then read a paper on the Lines in the Direction of the Dip, and their Avoidance (see p. 30). After a vote of thanks,

Mr. **Wharton Simpson** asked Mr. Davis if he had formed any opinion of the rationale of these streaks, and of his method of avoiding them.

Mr. **Davis** had not formed an opinion. He had noticed that whilst it was more common with some samples of collodion than others, yet no collodion or combination of collodion gave exemption.

Mr. **Howard** said that Mr. Davis had mentioned to him some time ago, and he found the remedy perfectly effectual.

Mr. **Simpson** said the subject was an interesting and important one, as few photographers were not at times troubled with this evil, without being certain as to the exact cause and remedy. He had noticed it most common in a bath which had just been strengthened by the addition of fresh strong solution, and had often found it gradually disappear as often as a few plates were excited. He had at times tried sunning, adding more acid, and other remedies, some of which seemed to mend matters, but it never had continued in his hands for more than half-a-dozen plates. Some, however, were much more permanently troubled with it.

Some conversation followed, in which the Chairman suggested a possible electrical cause, and a member suggested the imperfect surface of some glass as a cause.

Mr. **Blanchard** said that Mr. Davis had called it an apparition, and it appeared to him to be in some way connected with the action of spirits.

Mr. **Cooper** had met with the defect occasionally, and had found it removed by a method similar to that recommended by Mr. Davis. He had also noticed that whilst the streaks would be present on a plate which had remained two or three minutes in the bath, they were absent when it had remained ten minutes.

After some further conversation, in which Messrs. Davis, Blanchard, Hughes, Martin, and others took part, the discussion was adjourned. The discussion on Mr. Cooper's uranium experiments was also further adjourned.

The proceedings then terminated.

Amateur Photographic Association.

A **Council Meeting** was held, December 21st, at 12, York Place, Portman Square, **James Glaisher**, Esq., F.R.S., in the chair. The minutes of the last meeting having been read and confirmed, the following members and subscribers were proposed and elected :—Lord Otho Fitzgerald; John Gurney, Esq.; J. Middleton, Esq., Jun.; H. T. Butler, Esq.; Mrs. R. Malcomson; Mrs. Sankey; W. Eames, Esq.; Mrs. Skinner; T. Carter, Esq.; Mrs. Le Marchant Thomas; R. W. Comley, Esq.; A. A. H. Currie, Esq.; Capt. C. M. Layton; Mrs. E. Forbes; H. G. Astell, Esq.; W. Adamson, Esq.; Mrs. S. G. Adams; J. Taylor, Esq.; Miss Murphy; G. C. Wallich, Esq.: A. Wright, Esq.; R. S. K. Shand, Esq.; W. H. Pepys, Esq.

The **Secretary** then laid before the meeting the following prizes which had been awarded at the previous meeting :—

A Silver Goblet to E. R. Hall, Esq.

A Silver Goblet to Captain Mason.

A Silver Goblet to G. Bevington, Esq.

An elegantly chased Fruit Basket to W. D. Hemphill, Esq., M.D.

A handsome Claret Jug to J. W. Rimington, Esq.

A large handsomely bound Album to W. D. Howard, Esq.

A large and very handsome Silver Mounted Portrait Album to C. A. D. Halford, Esq.

A large and very handsome Silver Mounted Portrait Album to Captain M. Hutton.

A smaller and very handsome Silver Mounted Portrait Album to F. H. Lloyd, Esq.

The **Secretary** stated that all the prizes were obtained on the most favourable terms possible, and always more or less exceeded the amount awarded.

The Council expressed themselves much pleased with them, and a vote of thanks was passed to the Secretary for the time and attention he had devoted to the matter.

Lt.-Col. the Hon. D. F. de Ros proposed, and it was decided by the meeting, that the contemplated exhibition of the Society's pictures should be postponed until February, in the hope that it might better suit the convenience of the President and Council.

The proceedings then terminated,

A. Melhuish, *Hon, Sec,*

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Correspondence.

THE LONDON PHOTOGRAPHIC SOCIETY.

Sir,—The inactivity of the representative Photographic Society of England has so long been a favourite theme of animadversion amongst a certain class of persons, chiefly those who have never done anything, either by fees of membership or personal action, to improve it, that it is in danger of being regarded as a parrot-cry, having no interest to those really concerned. The regard you have ever shown for the real well-being of the society, and the approach of the annual meeting as a suggestive epoch, induce me to address a few lines to you on the subject.

I presume that it must be tolerably patent to every one that the inactivity of any association of persons is literally the inactivity of all its members, and the blame is necessarily somewhat divided. Such a body as the Photographic Society is responsible to itself, and if there be blame each member must exclaim *mea culpa*. The commonplace trivialities of a contemporary journal, to which I shall refer shortly, as to the society having "lost the confidence of the public," are clearly, therefore, unmeaning and silly, inasmuch as the "public," whose confidence it is concerned to secure, simply consists of its own members, in other words, the whole has to secure the confidence of all its parts.

The real questions which arise are : In what does the proper activity of a photographic society consist, and how are its activity and interest to be maintained? The primary duty of the society is doubtless to provide for each meeting matter of sufficient interest to make the evening instructive and agreeable; to secure papers imparting information or suggesting discussion; and to keep the members *au courant* with all novelties relating to the art, science, and practice of photography. This, undoubtedly, is the primary consideration. Ours is not a corporate body, having the power to confer diplomas; it has no legislative or other control over its members, or over the art. It can be, and should be, the representative and mouth-piece of photographers; but it can only hold such a position by the action of its members. How are the meetings, then, to be made interesting, how are good papers to be secured? Clearly by the action of its members individually and as a whole. It is no doubt very pleasant to have a scape-goat for any blame, and I have noted, with some amusement, the satisfaction it has apparently afforded to members, both of the council and general body, to have an executive officer whose real or alleged shortcomings have been supposed to account for evils clearly beyond his control. Whose duty is it then, to provide papers or other materials of interest for each meeting? As I have already said, it is the duty more or less of every member of the society capable of taking part in such work. But I shall be met here by the objection that the members, generally, delegate their responsibility to the members of council chosen by themselves out of their own body. This is doubtless true; but how have the members generally discharged the duty of appointing their representatives? They have simply neglected that duty altogether. For years past—I am afraid to say how many years—the nominees of the former council have been appointed, no single name has been suggested by any member, and the elections have each been, as the Chief Baron on one occasion phrased it, simply a farce, thus the council has become rather to resemble the members of a rotten borough than the popular representatives of a public body. Nevertheless, as the members have had the opportunity of nominating representatives, and have not taken the trouble to do so, they are to all intents and purposes responsible for the character of the body to whom, according to the rules, the "business" of the society is confided. Let me not be misunderstood in this reference to the council and other officers. Amongst the four-and-twenty gentlemen now in office, of whom I have the honour to be one, there are some bearing the most honoured names connected with our art. But the simple fact of this merely formal election insensibly suggests the merely formal and perfunctory discharge of duty, and thus gradually and almost unconsciously a lethargy has stolen over the council and the whole body; there has been no special or intentional neglect, but there has equally been no special consciousness of duty or of consideration as to its discharge. Hence, the inactivity of which it has been the fashion to talk.

The loudest complaint has been as to the scarcity or uncertainty of the supply of papers. How is the difficulty to be met? It appears to me very simple. I would suggest that, as in some minor societies, every member of the council should undertake to provide one paper during each session. This is surely not a hard condition. Many of the members of council are well able themselves to communicate valuable information to their brethren; but if they are unable or indisposed to prepare papers, they have each surely friends willing and able. It need not be imperative that each member himself should write a paper, but simply that he should either do so or induce some other person to do it; in short, that he should be responsible that for one half-hour during the session a meeting should be interested through his means. If this were done it would provide three papers for each meeting, clearly an *embarras de richesses;* but one not difficult to deal with. How have the council discharged the duty of providing papers hitherto? Of the four-and-twenty members not more than two or three have, so far as I remember, ever contributed papers at all. They have been, and I do not exempt myself from the implication, literally silent members. If the representatives of the society have sate in solemn, silent state, is it surprising that the meetings have been equally solemn and dull?

There is another definite reason why meetings are less interesting than they might be; and since it arises from a direct disregard of one of the rules of the society, I have no hesitation in naming it, and the consequences connected with it. The fifth clause of Rule VIII., states that "The chair shall be vacated as soon after Nine o'clock as may be convenient, and the Society shall resolve itself into a conversazione." From what cause I cannot with certainty say, but it has certainly happened frequently of late, that the chair has not been vacated until after ten o'clock; that delightful portion of the meeting expressly provided for in the rule above quoted, is entirely lost, and members have been kept from their homes until a very late hour notwithstanding. The reform to be effected here, rests chiefly with the chairman. We require a more social and conversational kind of discussion, in which all the members might feel at liberty to take part, instead of set speeches generally wearisome, and uninteresting except to the speaker. At the last meeting, one gentleman persisted in talking about a quarter of an hour after the chairman had closed the subject. I question if half-a-dozen persons heard him. I question if one cared to hear. It would be an excellent rule, and tend much to generalize the discussions, if members were each confined to five minutes speaking on any one subject. If any gentleman have more to say, which is worth saying, than can be said in that time, it may very properly become a subject for a short paper for the society, or a communication for the journal, in which form it would be better understood, and more perfectly remembered. Short papers, practical, scientific, or artistic; short speeches, and general participation in the subjects; with sufficient time afterwards for social re-union, and examinations of specimens, apparatus, &c., would add very materially to the interest of the meetings.

I have here briefly mentioned one or two subjects of importance, because, whilst they refer chiefly to the duties of the executive, they ought to be generally considered by the members, with whom it rests to bring their views to bear upon the council, who, with our excellent and energetic chairman, Mr. Glaisher, only require to be assured of the general desire, to carry it into execution.

I had intended to refer, in detail, to an article in one of your contemporaries, which, under a guise of friendly advice, and in an offensive tone of patronage, talks of the society having "suddenly fallen into decrepitude" the writer's ignorance of his subject being illustrated by that phrase, for, out of the ten years of the society's existence, for more than five years this complaint of decline and inactivity has been a chronic topic, talked about, and written about, as regularly as the annual meeting has come round. It is difficult, however, to deal with vague generalities, commonplace platitudes, and bits of downright nonsense, such as that in which the writer speaks of rival societies being "offshoots, the result of parental neglect." How an offshoot from a plant can be the result of some neglect in the plant, I don't understand. I can understand offshoots being the results of excess of parental vitality. But, sir, I altogether deny that our society has been, as alleged, "torn to pieces by internal discord," or that "angry and personal discussions" have "often characterized our deliberations." The only approach to anything of the kind I remember to have occurred at all recently, was when the proprietor of the journal in question wished to persist in discussing the propriety of his pirating the papers of the society by the aid of a short-hand writer.

In reference to the display of apparatus, &c., condemned by your contemporary, although it may be regarded by some as an infraction of the advertising privileges of journals, there cannot be a doubt of its interest to photographers; and when duly brought under the wholesome operation of the recent rule of the council, which renders its own prior examinations and consent necessary, is not liable, I think, to much abuse; certainly not to the same abuse I have known in minor societies, in which a chairman and journalist has lent himself to puffing articles exhibited.

As regards our *Journal*, sir, I do not think these, or the pages of any rival journal, the proper place for discussing its excellence or vitality. But when I look around and observe the calibre of some journals that do live, I cannot have much fear of the rumoured decease of the *Journal of the Society*—perhaps the wish was father to the thought—to which your contemporary, in professing to discredit, gives currency. Of the nature and details of the rumour I know nothing: for, notwithstanding that your contemporary asserts it has been "industriously circulated," it has not yet reached my ears. Perhaps, sir, on this point you can enlighten me. Apologising for the space which I fear my remarks will occupy,—I remain, sir, yours, &c.,

A Member of the Council.

[We know nothing of the rumour referred to, nor have we seen or heard any allusion to it except that coming from our contemporary. Our own pages contained a fortnight ago a congratulatory allusion to the increased vitality of the *Journal*, which has ever had our best wishes for its success and long life. We have pleasure in giving publicity to our correspondent's views on the society, but as a member of the Council, he is surely in the very best position for giving them effect himself. —Ed.]

MANUFACTURE OF OXYGEN.

Sir,—The question of safety or danger, in the use of the lime light, appears to me of so important a nature as to require all the ventilation that can be given to it; and as each one's experience may be found to differ a little, my own, perhaps, will be worth recording.

My first retort was a long iron tube, about four inches diameter at the bottom, and one inch at the top, a screw union connected this and the purifier by an half-inch pewter pipe; and to make the gas, the retort was put *in the fire.*

With this, an explosion would have been fearful, as, being screwed at both ends of the pipe, nothing could have given way, and I therefore sought for a less dangerous apparatus.

I purchased of Griffin a copper retort, a small zinc elbow connected the retort and the piping by means of *an india-rubber pipe;* and, in the event of anything stopping up, or the gas giving off too fast, the only evil was that the india-rubber pipe gave way, and the charge was wasted, *and here ended all danger.*

I exhibited every evening for many weeks last winter, on a 24-ft. screen (a size which compels one to use gas freely); and, as each day found us in a fresh town, with all manner of makeshifts, attendant on making our oxygen gas, and with oftentimes a double charge in the retort to make up for the limited time at our disposal, methinks that the system stood a very fair—or rather unfair—test. We have frequently—through over heating—had the india rubber blow off and the gas ignite, but beyond that all was safe.*

I have no doubt but that this system of connection by thin india-rubber pipe could be very generally adopted by those already in possession of apparatus, *and at but a trifling extra expense.*—I am, sir, yours respectfully,

William Pousty.

Dear Sir,—As an addenda to my letter on "The Production of Oxygen Gas" (which you kindly inserted last week), I beg to offer the following remarks :—

There are at least three very grave mistakes committed in making oxygen.

The first is, the notion that the process is one entirely divested of danger, even supposing the materials pure. That this is very far from being so, I can call to mind not a few cases in which the operator was startled out of his propriety. I have had several explosions, happily resulting in nothing more than the severance of the tubes. A friend of mine set fire to his office on two several occasions, and yet these explosions could not be attributed to the use of impure materials, but to the absurdly constructed apparatus. And this leads me to

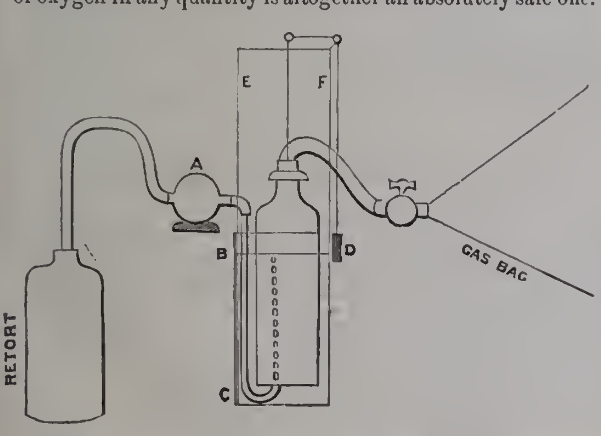
The second mistake committed. A very general practice (I might say without exception) is to have the tubing gradually contracting in diameter, until at the junction with the bag or gas-holder, the diameter of the tube is wholly unfit to discharge the *torrent* of gas which is evolved if the fire is at all strong; hence a blow-off must occur, if not something more serious.

The pipes must on *no account* decrease in size from the retort to the bag, and should not be less in diameter than *three*-fourths of an inch. If a bag of three or four cubic feet is to be filled, I always determine the diameter of my pipes by the quantity of material operated on.

The third mistake—and perhaps the most serious of all—is, the practice of passing the gas through apparatus that is *constant* in its capacity. Transmitting a gas that may be evolved in the gentlest manner, or with a fury and in quantity, that nothing short of a provision for the different conditions will meet.

Something must give way where everything is rigid, should the heat be sufficient to produce the gas in greater quantity than can be transmitted with facility.

To meet all these conditions, I send you a section of the apparatus I constantly use; and since I adopted it (along with the substitution of sand for manganese, the preparation of oxygen in any quantity is altogether an absolutely safe one.



The apparatus consists of the usual *iron retort*, a double-necked balloon A (which in the event of a decrease of temperature would be *filled with* water before passing into the retort) is connected with the washing apparatus B C, which consists of an outer vessel, made of tinned iron, zinc, or glass, with an inverted gas jar of glass, poised with a weight, D, attached to a string passing over the two uprights, E F. A tube from A passes down the inside of the outer vessel, and delivers the gas into the bell jar, from thence to the bag.

Now should the gas flow with greater rapidity than the pipes can convey it, the pressure being exerted on the bell jar, it rises simultaneously with a violent evolution of gas, and the capacity of the apparatus is instantly increased. An extreme case would be when the bell jar was forced to the top; and even then the gas would simply escape from the water, thus rendering danger of blowing-off or explosion impossible.—I am, dear sir, your obedient servant,

Peter Henderson.

3, *Ponn Hill, Clapham, January* 16*th*, 1865.

COPYRIGHT IN ENGRAVINGS, *versus* "PIRACY."

Sir,—My letter of last week, upon this subject, has received weighty corroboration of its principal point, viz., that the sale of unlettered or artist's proofs vitiates that protection which the Copyright Acts afford to print-publishers.

In the Chancery suit a report of which I enclose, the Vice-Chancellor's emphatic declaration has affirmed that to be correct. Hitherto, the Printsellers' Association have repeatedly characterized such objection as a merely technical one of little importance, which they were prepared to defend at law against any one of sufficient position to meet the expense. If unconvinced before, however, they must be now; and any future applications for damages, through photographic reproductions of such prints, would surely (if made) be liable to a counter-claim of damages for unjustifiable interference.

Photographers will anxiously await His Honour's authoritative decision upon the other points named in my letter, included in this suit, and referred for consideration to its further progress. Claiming (as a body) to be respectable men, and having interest alike with all other artistic producers in the maintenance of copyright, they will honourably respect real property, while showing (as instanced by the suit in question) that they are not to be deterred from legitimate trade by any assumptions that cannot bear the test of examination.

It is also noteworthy, that the use of the term "piracy," where the conduct of parties to whom it was applied afforded evidence of conscientious conviction of right, was condemned.

It is to be hoped that this suit will be comprehensive enough to determine definitely the long quarrel between photographers and the Printsellers' Association.—Yours, &c.

Detector.

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Talk in the Studio.

Photographs of a Dead Eye.—The alleged likeness of a human face obtained by enlarging a photograph of the dead eye of a murdered woman at Florence, has been going the round of some of the daily papers during the last week, some columns being devoted to circumstantial detail and comment. We have seen nothing hitherto, however, which throws more light on the subject than the communications which appeared in our pages a fortnight ago.

The "Art-Student."—Mr. Wall's magazine appears this month in its enlarged and improved form, and contains much interesting matter. An engraving from a photograph, entitled "Grief," by Rejlander, drawn on wood by the same gentleman, is exceedingly charming. The new series has our best wishes for its prosperity.

Another Death from Cyanide.—An inquest was held on Tuesday on Ellen Doberly, who had taken, accidentally, instead of strengthening medicine, a solution used in gilding;

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* The diagram which our correspondent sent by a subsequent post arrived too late to be engraved.

the bottle having been placed near to the physic. Deceased took a wine-glassful, and never spoke again. Dr. Conolly said he found her severely convulsed and dying from the effects of cyanide of potassium. A verdict of accidental death was returned, and strong censure expressed that a deadly poison should be left unlabelled.

Photographic Aids to Art.—The *Art Student*, in an interesting article in Mr. Herbert's fresco in the Palace at Westminster, refers to the photographic studies which have aided Mr. Herbert in his work, two of the granite slopes of Gabel Mousa being copied with minute care. There are in the room eighteen or nineteen negatives of living models draped, posed, and lighted as studies for the figure in his picture. The writer of the article observes, "Knowing, as we know, how many of our best men have secretly used photography as a valuable hand-maiden to their art without acknowledgment, or even admitting the possibility of such assistance, we admire the more Mr. Herbert's fearless honesty, and, while lauding it as creditable to the man, cannot regard it as in the slightest degree derogatory to the dignity of the artist."

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To Correspondents.

Leonardo.—The validity of any patent, once obtained, can only be absolutely determined by litigation; and whatever opinion we or anyone else might hold, any person infringing such a patent, of course, incurs the risk of an action. The result of the action would, of course, depend mainly upon the evidence which could be adduced in support of or against him. The fact that a process is as you state imperfect, does not, so far as we know, invalidate a patent. The fact that a process has been published before, is generally considered to invalidate a patent; but you would have to prove such prior publication in an action to gain advantage by it. We recently published the process in question, and the other processes similar to it, which had been published years before. You are quite at liberty to use the other processes; but if there be some minor point claimed in the patent process which is not in the others, you must avoid that point. 2. Thanks: we are always glad to receive suggestions. The questions asked by correspondents frequently involve answers requiring much more space than we can devote to them in this column; in such case we necessarily refer them to the best and most accessible source we know. It rests with the inquirer to determine whether the information is of sufficient importance to seek it where we indicate.

L.—We have discovered that through great haste and some carelessness in the binders, a few copies of our "Year-Book" have been sent out imperfect, one sheet being duplicated and another wanting. Any of our readers having received such copies will oblige by forwarding the imperfect copy by book post, with address, to our publisher, and perfect copies will be at once sent in return.

C. B. P.—Your new bath is possibly alkaline. Sun it and then add a little dilute nitric acid. 2. Adding carbonate of soda to a bath does not weaken it, unless sufficient is added to throw down a precipitate, in which case a portion of silver is thrown down. A bath does not get acid with use, unless a collodion containing much free iodine be used in it. 3. Without knowing the form of your glass-room, we cannot give a remedy for the bad lighting of which you complain. Send us a specimen and description of your glass-room, and we can, doubtless, help you. 4. The word studio is pronounced in three syllables. 5. A quiet grey is the best colour for the interior of the studio.

H. K.—We have, on enquiry, heard the rumour in question; but it appears to have been confined to a very small circle. So far as we can learn it has originated with some one connected with a rival journal, who had fabricated the rumour for personal purposes. We believe that the Society's *Journal* was never in danger of decease, having been a source of revenue rather than of loss to the Society. Both the Society and its *Journal* now promise a fresh accession of activity and success. The next meeting is the annual meeting, and, we believe, an interesting report may be looked for.

Charles Antrobus.—The rapid discoloration of the paper indicated some impurity or imperfection in the albumen. This would leave some contamination in the silver bath, causing a tendency to discolour even with a fresh batch of paper. Was the bath alkaline?

H. Taylor.—It is possible to photograph on vellum by using our collodio-chloride of silver process. See articles on the subject in the present number; the vellum will require to be coated with the sensitive collodion in the same way as if it were paper.

Would-be Photographer.—We do not know of any method of securing a certainly good lens for card pictures for £2. The price of the best English makers, the excellence of whose lenses would be guaranteed, is considerably more than that sum. There are several French makers whose lenses may be purchased for about that price, and some of which may be very excellent; but we cannot tell you of any means to obtain certainty at that price. You give extracts from the catalogues of two or three very respectable dealers; the best plan will be] to write to one of those with whom you do business, and ask him to select a lens of French make which he can recommend.

Fog on Film.—The defect with which you are troubled is generally found in under-exposed plates which have required a considerable amount of development. The fact that the fog is formed on the film and not in it, suggests that it is caused rather by some condition of the development than of the exciting bath. Sometimes it will be caused by using a newly-mixed iron developer with too little acid; the addition of more acid, or keeping the iron solution a few days will remove the evil. Sometimes it will be caused by impurity in the acetic acid.

Francisoo Bianchi.—The presence of iron spots in the paper is a serious trouble to all engaged in enlarging, and there is not, unfortunately, any absolute remedy for the difficulty. Whatman's paper has the reputation of being generally best. Mr. Woodbury has tried gelatine and did not like the result. It is quite possible, no doubt, to obtain good prints with iodide alone, but the addition of a chloride and a bromide seems in most hands to improve tone and give greater sensitiveness. The examples Mr. Woodbury has forwarded us in illustration of his process are very perfect indeed.

A Subscriber from the First.—We should select the ridge roof, with glass in each slope; glass in the side where you can have it, but no glass in front. The total height should be more than 10 feet if possible, and probably a little more side light would be convenient. You don't state the total length you intend to have, but, from what we glean, you are making the room shorter than will be convenient.

Alex. Arnstein.—We are obliged by your further communication, and hope very shortly to give you our own experience.

Oranges.—Your print undoubtedly indicates under exposure with negative, but it also shows the lighting to be imperfect. From the diagram you enclose, it appears that your arrangement of light is faulty in principle. The side light should be continued to the roof so as to join the top light, and thus form one continuous light. As it is, the top light and side light are so disjoined as to form two distinct sources of light, of which the top light is by far the most powerful. By extending your side light in height, and also carrying it a little further forward, and then covering much of the top light with blinds, you will obtain much more satisfactory lighting.

Pro-Photographer.—There are several good shilling manuals. That of Mr. Hughes, that of Mr. Heisch, that of Negretti and Zambra, and several others, are all excellent. A small equipment of apparatus may be had from £5 to £20, depending on the size and completeness.

A. B. C.—There is no process in which you can get an enlarged or reduced positive copy of anything direct in the camera on paper, unless indeed you use the Niello paper, upon which to produce a collodion positive.

S. T. S.—It is probable that your light will be improved by the piece of side light, which you say it is possible to secure; but we fear that it will never be very perfect with the restrictions which you describe. The use of the side light in question, the removal of some of the top light by means of blinds, and longer exposure will give you better results. Both the pictures you enclose are under-exposed, and not sharp: avoid the marked pattern on a background, which makes the picture spotty and destroys all repose.

L. A. D.—When pyrogallic acid solution becomes brown it loses much of its energy as a developer. 2. We presume that the colour of the print will indicate the time it requires to remain in the toning bath with Mr. Heisch's solution as with others, and that a grain of gold will tone as much paper in it as in other toning baths; as a rule, I grain of chloride of gold should tone at least one sheet of paper. The paper of Mr. Heisch, who is an able and accomplished chemist, is most interesting and valuable, and his explanation of the different kinds of tones produced as due to the degree of subdivision in which the gold is thrown down, doubtless, is correct; but we are disposed to attach more value to the presence of a minute proportion of hypochlorite of lime than he does.

T.—We should regard it as of vital importance to have an uninterrupted light from the north, if it were possible to build the glass-house in a position to secure it. If you have space and means, have the room at least 26 feet long and 12 feet wide. You will gain much in convenience and facilities of various kinds by using these dimensions. Have glass at both sides if possible, and on all the roof except about 5 feet overhead; no glass at either end.

Leo.—It is probable that your gold was contaminated with copper, to which the green colour is due. The sample bottle you sent arrived completely smashed, a mass of crystals and pounded glass embedded in cotton wool, which afforded no opportunity of examination. For toning purposes the presence of the copper will not be injurious. If you wish to get a good-looking sample, you should use pure gold obtained from the refiners for the purpose. The addition of carbonate of soda to a solution of your present sample will get rid of some of the copper by throwing it down as a carbonate; but the operation requires care to avoid throwing down the gold as well. Your letter contained no stamped or addressed envelope.

G. W. R.—You may give a convex form to a single disc of any size without infringing the rights of anyone.

B. L. P.—In taking a negative through the glass, so that the image may be non-inverted in the negative, it is necessary to allow for the thickness of the glass in focussing. It is important also that the back of the glass be wiped quite dry and clean, and also that it be free from flaws or defects. On the whole, we think it is better to adopt the system of transferring the film when such a negative is required.

Several communications standing over, and several correspondents in our next.

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Photographs Registered during the Past Week.

Mr. James Laing, Castle Street, Shrewsbury.
Four Photographs of Thomas Ellis, alias "John Morgan.
Mr. Josiah Groom, Wyle Cop, Shrewsbury.
Two Photographs of Thomas Ellis, alias "John Morgan.
Mr. J. Stringfellow, High Street, Chard, Somersetshire.
Photograph of "Hangross Tree," at Chard.
Mr. James Burke, 44, Lower Ormand Quay, Dublin.
Photograph of Robert Emmett.
Mr. Henry Lambert, 10, Fountain Buildings, Bath.
Two Photographs of Rev. Barnard.
Mr. William Saxby, Tanner Street, Faversham, Kent.
Three Photographs of Mr. Wm. P. Hoare, Surgeon.
Mr. Joseph Roberts, Draycott-in.the-Clays, Sudbury, Stoke-on-Trent.
Two photographs—Mr. Henry Archer and Mr. Charles Wood, wild-fowl shooting.
Mr. John Aylmer, 6, Hamilton Row, Dublin.
Two photographs of Rev. Robt. Cook, O.M.I.
Hereford Photographic Company.
Copy of Old Engraving.
Messrs. Fergus Brothers, 5, Albert Place, West Black Hall Street, Greenock.
Photograph of Rev. Alexander Brunton, Glasgow

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PROPORTIONS IN PORTRAITURE.

A Correspondent recently put a question, which has not unfrequently reached us before, as to why in some card pictures, persons look taller than they are, whilst in others they look shorter. To experienced portraitists the subject is simple enough, but is less so to the tyro in the art. There are, moreover, questions connected with the proportions and relative size which should be given to men, women, and children, in card portraits, not satisfactorily determined by old and skilled portraitists. A few words on the principles involved may, therefore, not be without interest to our readers.

The question of relative height of persons in card pictures can only be determined absolutely by photographers working to scale, a practice adopted by some on principle, and by others without design or intention, but as the result of instinctive good taste. Some years ago we suggested a scale based upon a consideration of the necessary pictorial conditions, and an examination of the works of some of the ablest artist photographers. We then suggested that every condition for truth in portraiture and pictorial effect was best attained by giving half-an-inch in the picture for each foot of height in the model, and we found on examination that the productions of the best portraitists bore about that proportion. The normal size of the card picture is three inches and a half, by two inches and a quarter. The standing figure of a man of six feet high, based on the scale we have named, would be three inches long; and this in a picture three inches and a half long would suggest, as it ought to do, a tall person. A figure five feet six inches high, would on the picture measure two inches and three quarters, which would suggest, in the same space, a person of middle height; and a figure five feet high, would be in the card two inches and a half, rightly suggesting a short person.

But independent of the question of scale, there are other circumstances which govern the suggestion of height and proportion; these consist in the size and character of the accessories, and in the position the figure occupies in the picture. Where a portion of the figure only is included in a picture, the latter question is all important; but where the full length figure is taken, its influence is less, although still not without effect. If a three-quarter-length figure be taken on a card picture, and a space of an inch be left above the head, the suggestion of a very short person will at once be conveyed. On the other hand, if but one-fourth or one-eighth of an inch be left, the idea of a tall person will be produced. If the full length figure be taken even accurately to scale, the suggestion of height may be materially modified by the position of the figure. If, for instance, a man five feet six high, taken on the scale we have named, be placed in the picture, so that a space of but a quarter of an inch be left overhead, the impression produced on the mind of the observer will be that of a tall man; and on the other hand, the effect of a short man may be produced by taking a figure of six feet height on the same scale, but leaving half an inch overhead. Perhaps the best result both as regards proportion and pictorial effect will be produced by producing standing figures to the scale mentioned, leaving about one-eighth of an inch at the feet, and the remainder in all cases overhead.

The effect of accessories in this respect is important: but not of an absolute character, as the objects which can be used have no necessarily definite size. Nevertheless, chairs, tables, &c., have sufficiently general proportions to be at least suggestive as indications of relative size. Some time ago, we remember that *Punch*, who often contrives to get a little fun out of photography, gave to photographers, what he facetiously regarded as a capital idea: he suggested the use of a set of minature accessories, such as tables, chairs &c., so as to give a tall and noble effect to under-sized men, some of whom are disgusted at their diminutive stature as rendered in a photograph. A simpler plan would have been, of course, to avoid tell-tale accessories altogether in such portraits, and by approaching nearer with the camera slightly enlarge the scale. Where accessories are used, however, their size is important, and we have known pictures seriously marred, by having miniature furniture introduced, which has destroyed scale, and given a mean and diminutive effect to the picture. We are not now dealing with the question of composition, or we might point how good or bad composition at times may effect the suggestion of proportion, especially the effect of giving accessories an advancing or retiring position. The consideration of composition, is, however, too comprehensive a question for our present purpose.

In our suggestions for working to scale, we have, of course, been dealing chiefly with the treatment of grown persons: their application to the portraiture of children involves some fresh considerations. The question arises here at the outset, more pertinently than in regard to grown persons, as to whether the object to be secured is literal truth of proportion, or portraiture with pictorial effect. In the portraits of grown persons, both may be easily secured; but in those of children, it is more difficult. A little child, for instance, of three feet high, taken to scale and measuring, therefore, only an inch and a half in the picture, would, without very skilful arrangement of accessories, make a very insignificant card picture, probably unsatisfactory to every one. If, however, a series of family pictures are to be arranged in one album, for comparison together, the same scale, we conceive, ought to be preserved throughout. This is more imperatively the case if such portraits be intended for friends at a distance, in whose minds a true impression of the originals must depend much on relative proportions. Again, wherever the admirable system is adopted of preserving a family history in the shape of dated photographs is adopted, the scale should be rigidly preserved. We cannot conceive a more interesting family record than might be preserved by having a portrait of each member taken every birthday. What more interesting portrait gallery than that, consisting of each member of the growing family, taken each year from one year old to one and twenty? What a record of the gradual growth and development of stature, feature, and intelligence! But to preserve the true value of such a record, truth in proportion, based on scale, should be preserved. To make satisfactory pictures, of young children under such circumstances will unquestionably tax the skill of the ablest artist, and something of pictorial effect must probably often be sacrificed for truth. A highly skilled portraitist of our acquaintance denounces the demand for accurate proportions in such pictures, as a desire for maps of the face and figure rather than portraits. We believe, however, that truth may be secured without an entire disregard for artistic result, and that, where the purposes to which we have referred exist, both should receive the attention of the portraitist.

Where comparative proportion is unimportant, it is tolerably certain that more pleasing and important looking pictures, of children can be obtained by some disregard of scale, and the production of an image childlike in dimensions, but not diminutive and insignificant, avoiding on the one hand, a vast blank space sf backgroaud above, below, around; or on the other the impressing into the picture of every possible accessory to fill up the dreary empitness. Some idea of proportion may still be maintained by the juxtaposition of accessories of normal size, placed judiciously to suggest relative proportion. In this respect the skilled and informed portraitist will succeed in producing a satisfactory portrait suggestive of truth, but wanting in nowise in pictorial effect.

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PHOTOGRAPHS ON DEAD EYE AGAIN.

WE had hoped, a few weeks ago, that we should not have to bring this subject again before our readers; but as the Florence case has again been brought before the public with much circumstance, and the details may in future be referred to in connection with the history of photographic fallacies, we give some extracts from those published. The Florence correspondent of the *Morning Post* devoted a column and a half of that paper to the subject. After giving some details of some mysterious murders recently perpetrated in Florence, he says,—

> But now comes the circumstance by which the history of this man will be distinguished for ever from that of mere ordinary criminals. Viti, the head of the Florence police, again insisted with so much eagerness on having the eye of Emilia Spagnoli, the last of the three victims, photographed, that his request was complied with. Under the direction of Marabotti, the examining judge, or Giudice d'Istruzione, a series of photographic experiments have been carried on, not for the special purpose of furnishing additional criminal evidence for conviction (as the other evidence, with that view is believed to be superabundant), but in order to establish a general principle or law of universal or very frequent application. I have said that Emilia Spagnoli was found lying on her left side, her large, glazed right eye being turned upwards. The eye was photographed immediately after her decease. The photograph then taken has been reproduced in a greatly magnified form; so greatly magnified as to allow the lineaments of a human face, two inches in length, to stand out distinctly from the same. When I mention that Alinari, the first photographer of Florence, and, indeed, possessing a European reputation, was the artist by whom the work was executed, I need say nothing more as a guarantee of the fidelity and care employed on the occasion. From the tracing of the dim and nebulous outline, as actually found on the eye, to the completed outline of the face as executed from that tracing by an artist who had never seen Benjamino dei Cosimi, or any portrait of the man, and again, from that completed outline to the two photographs of himself found in his possession at the time of his arrest—the transition, whether viewed as an artistic study, or as a great question of medical jurisprudence, opens up inquiries of unsurpassed interest and importance. I am not, indeed, prepared to affirm that the first tracing in the series, as shown to me yesterday, by the courtesy of the Judge of Instruction, Signor Marabotti, at his official chambers, so completely resembles the photograph of the living man that, were I placed in a jury-box, my verdict would be determined by the belief in their identity, but of the following fact there cannot be the possibility of doubt. Whatever there is of marked, prominent individuality in that first nebulous profile has an exactly corresponding feature in the likeness of the living prisoner. A peculiar dilatation of the nostril, a depression in the centre of the upper lip (Benjamino dei Cosimi has lost his two front teeth), an unusual elongation of the mouth, a square, but double chin, a certain massiveness about the region of the cheek-bone, and the outline of a whisker are common to both.
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> I purposely confine myself, in the present letter, to a simple statement of facts—of the circumstances under which these murders were perpetrated, the consequent photographic experiments instituted, and the results obtained, of which I was yesterday an eye-witness. There are very distinguished anatomists—persons, too, deeply versed in all the laws of optics— who affirm that the whole thing is a mere freak of nature, to which no importance whatever should be attached.
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> I am happy to add that Signor Marabotti, with whom, from his official position, the prosecution of these enquiries rests, has evidently brought to his task a spirit worthy, in all respects, of a countryman of Galileo. The photographs, with all the accompanying and illustrative details, have been transmitted not only to the Medical College of Florence, but also to the medical colleges of Naples and Milan; and, by the authority of the Prefect of Florence, Count Cantelli, a series of photographic experiments will be instituted on the eyes of the patients in the hospital immediately after their decease.

Apparently, nothing can be more circumstantial or satisfactory. "Our own Correspondents," are generally intelligent men, and although at times under temptation to exaggerate, there is every reason why they should avoid fabrication in matters certain to be investigated. In this case his narrative appears to be the result of misinformation, misconception, and erroneous deduction. Here is the narrative of the correspondent of the *Daily Telegraph* in the same city;—

> I do not like to fall foul of any journal, especially one published near Fleet Street. But in defence of Florence I am bound to say that a letter, inserted by a fashionable contemporary about the photographic portrait of a murderer being taken from the eye of his victim, by Alinari, of Florence, is the most melancholy nonsense I have read for some time. The letter is introduced with a flourish of trumpets, and has, I perceive, actually been followed up by a leading article. Now, it is no business of mine here what people write about any place but Florence; and, as long as they do not violently malign it, I should perhaps do well to hold my tongue. But when London is gravely assurred that Florence has shown itself worthy to be the country of Galileo, by its scientific men's receiving the sheerest cock-and-bull story that was ever palmed off upon the credulous, I feel justified in saying that the scientific men of Florence have not made, and are not likely to make, such fools of themselves. To have done so would have been to prove that they knew nothing of the anatomy of the eye, and nothing of the law of optics. It so happens, in this case, that the hazy outline which, in the photograph, we are asked to believe represents part of a man's face is *on the cornea of the eye, and not on the pupil at all.* So that, for the purposes of the theory so ignorantly pressed upon the public, the hazy outline might just as well have been on the victim's nose. The writer of the letter in question is manifestly not aware that the impressions which produce what we call sight are wrought through the pupil upon the retina, and no more upon the cornea than upon the hip-joint. So much for the simple anatomy of the question. But, even supposing that there was a hazy outline of a face in that part of the photograph which represented the pupil, what would that represent? At best, nothing but a cloudy something on the *outer surface of the pupil, and nothing at all upon the retina,* which these rash folks seem to be unaware is the receptacle of ocular impressions. However, let people make what blunders they please; only let them be good enough not to confound Florence with their absurd errors. Florence *is* worthy to have been the home of Galileo, and for that very reason is incapable of such outrageous ignorance on a scientific subject as is here imputed to her. Thackeray once said it would be very convenient if we had glass windows in front of our breasts. No doubt. And it would be equally convenient for the new "discovery-of-murderer" theory if we had glass or something like glass in faont of the retina, instead of a protecting surface which will require a novel application of the ophthalmoscope before photography can be dragged in to tell its secrets.

HOW TO TAKE VIGNETTE NEGATIVES IN AND OUT OF THE CAMERA — OLD AND NEW PROCESSES.

BY J. WERGE.

A provisional specification for a "New Vignetting Camera," having been recently filed, I was somewhat surprised on reading it, to discover an attempt to secure a monopoly of a thing as old as the days of daguerreotyping, and I published a kind of protest against it in the form of a "prior claim" on the ground of "previous knowledge;" and as that protest brought out two other "claims," I have thought it would be advisable to draw up a sort of history of the various modes of vignetting in and out of the camera, with which I have been acquainted and have practised for many years. I was induced to do so with the view of showing how absurd it is for any one to attempt to patent so old a process. And to prove that I was previously familiar with all the characteristics of such a camera as that claimed by Mr. Mac Nicol as "his invention," and also, that by Mr. Sarony, I know not how old the idea of vignetting in the camera is, nor do I know who first conceived the happy thought; but such data as I have, I shall willingly give, and with equal pleasure the names of those to whom credit is due.

The first method of vignetting in the camera which I remember consisted in obtaining a vignette on a *black* ground, by placing in the camera a diaphragm, between the lens and the plate, so as to intercept a portion of the rays coming from the sitter, and produce a vignette of a form corresponding with that of the diaphragm.

In the second plan with which I became acquainted, a vignette was obtained on a white ground. The plate was exposed in the camera as in the former process; and, before developing, a piece of glass with a black disc in the centre, or thereabouts, was placed before the plate, which was then exposed to diffused light for a second or two, the disc protecting that part of the plate which had previously been exposed to the sitter. As a matter of course, the resulting picture was a vignette on a white ground. The idea of covering the head with a disc, and exposing the other part of the plate to diffused light is due to Mr. Mayall, who, if I mistake not, published the process in 1849 or 1850. At any rate in 1850, I produced vignetted Daguerreotypes in that way, after Mr. Mayall had published his method.

A third method of obtaining a vignette direct in the camera is as follows:—Between the sitter and the front of the lens a white or light screen, with a hole in the centre, was placed so that the sitter had the appearance of sitting behind a large white frame. The edges of the hole being jagged and out of focus, the result was a very soft and pleasing vignette effect. Sometimes the sitter was placed against a light background, and a *half* screen of the same colour as the background, placed between the sitter and the camera, the edges of the screen being of a cloud form, the vignette effect was very good. This would be improved by *suspending* the screen from the roof of the operating room, slightly agitating the screen while exposing, to obtain increased amount of softness. Who was the author of this process, I really do not know; but it is very old, for I first saw it practised by Mr. Cady, in New York, in 1853.

Fourth plan. Another method, of whose parentage I am also ignorant, but which I first saw employed by Mr. Bushnell, in Philadelphia, in 1854, consists in placing the subject against a light background, with a *shaded*, or darkened centre, and then with a large hand screen of the same colour as the light part of the background, cut off the lower part of the figure. The hand screen being of a cresent form, and moved about by the operator during the time of exposure, the form and quantity of the vignette was entirely under his control. By this mode of working, very soft and artistic effects could be procured.

Fifth. Another and simpler method of obtaining a vignetted negative direct in the camera, is to take the picture on an ordinary vignetting glass at once. This plan has been very successfully practised by Mr. Earnest Edwards.

Sixth. One more very simple way to vignette a negative, is to take any ordinary negative and coat the back of it with "Aldis's non-actinic varnish," and before the varnish is dry, take a pellet of cotton wool, and wipe off the varnish from behind the head, and as far round as you wish. By this means, any form of vignette and amount of softness can be obtained, and any artistic effect you may desire, can be easily produced. Where large numbers of prints are required, as from publication negatives, this, or Mr. Edwards's mode is probably the best that can be resorted to.

In conclusion, I will describe the "vignetting camera" I ordered to be made nearly three months ago. It is to be an ordinary carte de visite camera, with a diaphragm of glass, wood, cardboard, or metal, in the body of the camera, as described in the first of the six processes I have detailed. After the plate has been exposed to the sitter through the aperture, the diaphragm is to be removed, and a glass plate with a disc in the centre or thereabouts, or an ordinary *positive* vignetting glass put in its place by means of a slide and groove in the camera. Then the plate is to be exposed again through the lens to a white screen placed before the sitter, or after the sitter has gone away, the disc or positive vignetting glass protecting that part of the plate which was previously exposed to the sitter. This is the camera which Mr. Mac Nicol claims as "his invention," and which is very similar to the one described in Mr. Sarony's provisional specification. But, as you will observe, it is only a combination of the first and second processes I have described, and which were known to almost every Daguerreotypist in England and America, long before the collodion process was heard of. I should think after this, both Mr. Sarony and Mr. Mac Nicol must consider their claims to originality of "invention" or "improvements in this direction," rather weak and untenable.

[We may add to this interesting note on vignetting systems one with which Mr. Werge as an old Daguerreotypist is doubtless familiar, but which has possibly escaped his memory. We practised the method to which we refer twelve years ago, having first seen it in America in 1852. It is only applicable to Daguerreotypes. It consists in covering the plate after exposure with a mask of wood having an oval aperture in the centre, the edges of which were bevelled in a fashion similar to the old French passe-partoutes. The plate was then submitted to the fumes of the mercury for development. Where it was protected by the mask, no development took place, and the partial development produced by the vapour creeping under the bevelled edges of the aperature, graduated the tint from the white of the background to the black of the margin. On page 104 of the Photographic News, vol. iv., we gave a diagram of a screen with a serrated oval aperture, which, placed midway between the camera and sitter, vignettes the negative in a manner similar to one of the methods described by Mr. Werge. We have produced excellent results by the method we then described.—Ed].

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Jottings for 1865.—No. 1.

REMARKS ON URANIUM PRINTING.

BY A PHOTOGRAPHER'S ASSISTANT.

When photographic art shall have reached the summit of perfection, with its principles clearly defined and understood by the majority of its practitioners; when the weeds of empiricism are rooted up, and patience-trying experiments no longer an absolute necessity; when speculations give place to certainty, in short, when the art takes its standing among others that long since have attained full stature, how interesting to the student of that age will be the perusal of photographic publications that belong to time present. Processes come tumbling in from every direction. Each clamouring for recognition. Each claiming attributes superior to its predecessors. But, alas! there is a human law that influences inventions as well as individuals; their fate in a large measure depends on the popularity of the inventor. Schemes that deserve better are laid aside unnoticed, whilst others, more fortunate in their herald, make their debut with the most brilliant eclat, and for a time, at least, remain the observed of all observers. Happily, the lynx eyes of pure science remain undazzled, ever willing to grant its measure of applause to that which is genuine; but without mercy when unsoundness presents itself, and woe betide the scheme that is started under false colours, when the pruning knife of chemical analyses lays bare the hidden mystery,—at once the tide of public favour is at an ebb, and hissing anathemas are hurled from the lips and pens of its once ardent admirers. Good qualities are lost sight of, and the scheme or process is declared an imposter. Injudicious in our first applauding notice; unjust in the sweeping condemnation that follows, because a new comer, necessarily weak in its rudimentary form, as a rule possesses latent qualities that entitle it to some consideration, requiring but the fostering care of the intelligent experimentalist to bring it to perfection.

Fortunate in their degradation, inventions that would seem to expire with their introduction are lost sight of only for a season, to rise again and ride bravely on the waves of popularity, and in their turn have to stand or fall as they may or may not meet the requirements that are demanded. It will prove so with many of the suggestions and beautiful experiments of Herschell. It will so follow with the important researches of Swan, Pouncy, and others labouring in the same field. It has so turned out in more than one instance in connection with the ingenious labours of Burnett; now, in the revival of what has become the photographic lion of the day. A leading article inserted in a leading journal sings the praises of uranium. The grand climax is reached, for uranium sets its everlasting seal on photographic productions. France believes it, England doubts it, America cannot arrive at a favourable verdict by any method of calculation; but what matter? the *Times* has faith in the powers of uranium.

Let triple salts, new metal, Harz oël, starch, arrowroot, and rezins shower down on our devoted heads; but let us pause ere we are persuaded to do homage to the shrine of Wothly. Let us examine the new printing process fairly, calmly, and free from prejudice. If permanency by its assistance may be secured, together with satisfactory results, accept it; except we can secure the same benefit from a process that is unfettered by patents, which last condition approaches very nearly the bounds of probability, as we shall endeavour to prove hereafter. But our business in the present paper is to discuss the principles of uranium printing (so-called), and to compare its advantages with those possessed by the old plan of printing on albumen and plainly salted papers.

The Wothlytype enjoyed the peculiarly good fortune to be launched at once on the widest sea of popularity, because silver (the supposed author of every fading mischief) was considered to hold no partnership in the concern. Uranium set our brains whirling, and the lips of every genuine photographer quivering, to bless the name of Wothly. But now, sober science steps in to examine. "No silver"—stuff; silver reduced by uranium on the dog-rob-dog principle. Nitrate of the peroxide of uranium reduced by light to a salt of the protoxide, doesn't like its lowly condition, so robs nitrate of silver of its oxygen to make good the loss, when the silver thus liberated resolves its particles in the formation of a weak image, should a negative regulate the admission of light. Development in a new form, but results too weak for ordinary printing purposes. Call it delicacy if you like, but delicate prints obtained from harsh negatives mean weakness in the surface deposit, and nothing better; so that without an organic admixture the process would prove comparatively useless, as harsh negatives are exceptions and none would desire it a rule. To meet the difficulty Harz oël chimes in, and Wothly is secure, save in the success of his attempts to palm off a printing process unassociated with silver, or the necessity of fixing by the usually employed agents. No sooner does science publish its unfavourable report than photographers stand aghast. "Silver! vile imposition! permanency a sham! away with the process for we will have none of it!" The sun of Wothly in this country totters in its meridianal glory, then, swifter than the shooting-star, it glides past, and bids fair to be speedily lost behind the clouds of prejudice.

The sentence passed is as unjust as the previous shouts of admiration were premature. The condemned process is one that, with all its apparent faults, deserves a better lot, a scientific study; it illustrates principles of the most interesting character. The decomposing power of light on one body, producing results that bear a striking analogy to development as carried out in the dark room.

That uranium forms no portion of the print all authorities seem to be agreed, although the salt being sold in various stages of purity, that, doubtless, influence results; but, according to Pelegat, "such changeable conditions may be prevented by dissolving the crystals of uranium in ether, and allowing the solution to evaporate in the air, when it deposits a pure salt, which is separated from the mother liquor, and again dissolved in water and recrystallized." Proceeding with our analysis, we find silver precipitated by development forms the first part. Next, silver as an organic compound reduced in the ordinary manner, so that, in point of fact, the absence of chlorine only causes the difference between the Wothlytype and the systems generally adopted; but the probability the first holds of permanency is far in advance of those held by the latter, by reason of the basis on which it is supported, viz., collodion. Paper is a complex compound, and many of the constituents in its body, doubtless, assimilate by affinity with silver. Salts, soluble and insoluble in hypo solutions, are formed, and destructive sulphuretting agents cling tenaciously to every fibre in spite of prolonged washings, and decay is almost a certainty. Collodion, on the contrary, is inert, because the substances that enter into its composition form no chemical combination with the salts employed; and under necessary conditions (that may easily be secured), the picture is formed in the collodion, altogether independent of the paper; and from this fact we might reasonably conclude, that printing in collodion will prove more permanent than it is possible to obtain from albumen. The composition of the last-named article being so complicated, and, perhaps, forming a variety of the salts of silver, that lasting prints obtained from such a source cannot be expected. But here the question suggests itself, Is collodion liable to decomposition? A voice from across the broad Atlantic answers, Yes. "Gun cotton is frail. The peroxide of nitrogen it has obtained by substitution is treacherous. Do not trust it." Time only can determine the lasting qualities of collodion; but we believe the danger that may arise from the presence of peroxide of nitrogen might be regarded as a shadow rather than a reality. The enemy in question necessarily lurks in pyroxyline undissolved, but does it exercise further influence when the cotton assumes a gelatinous form after solution? A salt precipitated from an aqueous solution still retains all its original properties, but the evaporation of spirits associated with pyroxyline leaves a deposit that offers a striking contrast when compared with gun cotton, which fact leads us to the conclusion, that spirits by combination effect a change in the chemical character of the cotton, the nature of which, so far as we can learn, has not been determined. One thing is certain, we have data to assist us in forming an opinion, in the fact of collodion being an old servant, and sufficiently tried to prove that, far beyond the average age allotted to paper prints, it clings to the glass unchanged. A very moderate washing being sufficient to protect the silver it bears; and seeing that with a good body of collodion, the paper employed in the Wothlytype process, or that suggested by Mr. Wharton Simpson (which will prove equally good), acts a subordinate part only. We see no reason why, with ordinary care, the print should not endure so long as (what for distinction we may be permitted to term) a glass impression; so that, after all, Mr. Wothly has done good service, in causing renewed attention to the subject; and although he has practised what our forefathers called "Flamburgh," from him we might, perhaps, date the decline of prices in the egg market, and an increased demand for cotton wool, more especially as a process will shortly be offered to the readers of the NEWS, that promises all the virtues of the uranium process, but untrammelled by patent rights or special reservations.

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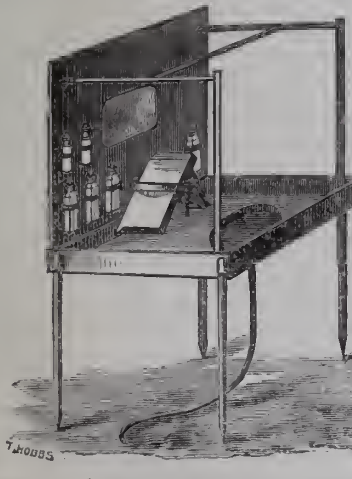
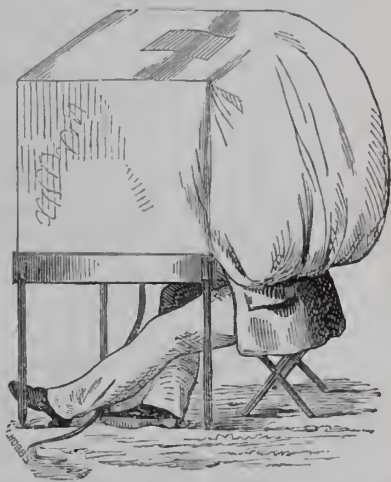
AN AMATEUR'S PHOTOGRAPHIC EXPERIENCES.

BY WALTER NOEL HARTLEY.

BEING home from Edinburgh for the long vacation of three months, I took to photography as an amusement, and as some very charming pictures presented themselves to me out-of-doors I naturally wished to prosecute my amusement there as well as at home. My first impulse was to employ a dry process, and I chose tannin, and gum as a preservative; but as this was not altogether to my liking, I set myself to work, in conjunction with a friend, to find out something better, and we constructed a very portable apparatus for producing pictures by the wet way. As nothing so convenient has yet come before my notice, I now proceed to describe it, and and some other little details of importance.

For plates up to 5 by 4 take a wooden tray, 20 inches in length 15 inches in breadth, and 2 to 2½ inches in depth, made of dry deal firmly put together; a flat board, fixed on by leather hinges serves best as a lid. A circular hole, about 6 inches in diameter, is cut in the bottom, into this is fixed a pan slightly concave and with a rim, in fact, shaped like a saucepan cover, and having a hole in the centre, to which is soldered a tube half an inch long, to serve as an attachment for a flexible india-rubber pipe to carry off the dirty water. For the sake of lightness this pan should be made of sheet zinc, a better but more expensive material is gutta percha. Within the box, and to each side, should be screwed, so as to work as on hinges, slips of oak or other tough wood, short enough to lie down; to the ends of these, strips of the same length, also moveable in the same manner, are fastened, so as to form jointed arms one on each side. The lid is now opened up, so as to be perpendicular, the arms likewise as far as the joints, but from here the second limbs are raised so as to be horizontal; a hook at the end of each catches in a loop fastened near the top of the lid. This put up, we have the skeleton of the dark chamber. A large, black calico bag is next made, so as to be nailed along the two sides and the front edge of the bag, and along the three edges of the lid; it should measure, to be comfortable, 3 feet 6 inches in its greatest height; to cut it out two pieces are cut 42 inches long, and 15 inches wide, another 42 by 20 inches wide, whilst the third is 27 inches long by 20 wide: this is the bare measure, without allowing a little in each case for seams; a stout string should be run round the open end to draw the folds tight round the operator's body, this arrangement is better than elastic. Two strips of wood, one to prop the lid open, and the other to cross from arm to arm to give more support to the calico roof, give the finishing touches to a dark chamber at once portable and convenient. Light, and the internal arrangements, as regards chemicals, are the next things to be thought of. A hole, cut in the lid, into which is nailed a translucent yellow material, such as silk or calico, dispatches the first (an excellent thing is either material dipped in a hot strong solution of bichromate of potash and gelatine in water); strips of leather, tacked to the lid inside, forming receptacles for bottles of 4 or 6 ounce capacity, and a strap to support the bath, settles the second matter. The next thing to be discussed is the subject of legs, and which for some time was unsettled in my mind; however, I think ferrules nailed to each corner and closed at one end, into which fit oaken rods, spiked so as to take firm hold in the ground, and which, when taken off, slide into strips of leather on the outside, put an end to this serious difficulty. Kneeling down is a comfortable way to work; but if one wants to take it easy the additional weight of a camp-stool, strapped to the outside, has to be carried. The calico case, bottles, and plates (if not in a box), with some other little things goes inside. A courier bag to sling over the shoulder, screw bath, folding camera and stand, complete the outfit. The question may be naturally asked—what is one to do for water? All the water necessary for six or eight pictures may be held in a pint and a half bottle carried in the courier bag with collodion bottle, &c.; so small a quantity is made sufficient by the following instrument, known to chemists as a washing-bottle: it is a common bottle provided with a cork bored with two holes, through one is placed a tube, bent three inches or so from the end at an acute angle, and drawn out at that end to a fine point, the other end reaches to the bottom of the bottle; another tube, bent at an obtuse angle, only passes just through the cork, when there is water in the bottle; if one blows in at the short tube a fine but forcible jet is sent forth from the other, by which means a picture 4¼ by 3¼ may be washed completely, that is, after developing and after fixing. A spirit lamp, matches, and a little plate-cleaning solution also. I





provided myself with ammonia, acetic acid, solid sulphate of iron, cyanide of potassium, and varnish packed inside my case, plates also; I folded the first in the end of a long strip of lint; the next, laid on this, was once wrapped round, then another, and a third fold made, and so on. The use of the spirit-lamp is to dry the plates, first wipe the backs with a cloth, and hold the negative over the flame rather high up, continually moving it about, steam gently arises, a dry spot appears in the centre, and at last it is quite dry, but frequently too hot for the varnish immediately; when cool enough for the hand to touch it in the middle it may be varnished as usual. All this should be done inside the apparatus without opening it wide for fear of dust spots. Most of my pictures are free from the slightest speck, and none ever wanted touching up. Care should be taken not to use too large a flame, or the destruction of the apparatus may ensue.

My next consideration is the chemicals. Coins are dissolved in dilute nitric acid, and evaporated in a cup or saucer in the oven, in the absence of chemical apparatus; the residue dissolved in distilled or rain water, or melted ice or snow, and, if acid to test paper, ammonia is added till the appearance of a deep blue colour; a few drops of acetic acid then being added forms a bath, which works as well as could be wished (35 to 40 grains to the ounce); it is no matter copper being present, for the haloid salts of copper are very sensitive to light.*

My developing solution consists of 20 to 25 or 30 grains of sulphate of iron, and 10 to 20 grains of tartaric acid, in an ounce of water. As little acid as possible is better to work with. I give a difference in numbers to show that to a considerable number of grains of variation the developer works well, but slowly the more acid there is in it. Alcohol is added when required, that is, when it flows greasily over the plate. It should be poured on the plate and floated from one corner to another till the picture looks quite black.

When one has seen the quantities of the ingredients weighed two or three times, it is quite safe, in cases of emergency, to make it by guessing the proportions; this is one advantage over most developers; another is, the negatives very seldom require intensifying, also tartaric acid packs more easily to take out, and is not so expensive as acetic; moreover, this solution is everything to be desired for an intensifier.

A portrait taken in the dark weather at the end of October proved on developing to be too weak for a positive; but before washing, a solution of silver, a little of the bath, in fact, was poured over the plate; after remaining a minute, some developer was added to it, and the mixture returned to the little evaporating basin I always used for the purpose; and then put on the plate again, and so on till exhausted; fresh silver and fresh developer was then taken, continuing so till a negative, everything to be desired, was the result. Varnish I made by dissolving mastic in alcohol till of the required thickness, and filtering though porous paper or cotton wool.

At one time, when the screw bath I used leaked, I carried the silver solution in a bottle and emptied it into the ordinary bath whenever I pitched my tent. I carried a small funnel to return it to the bottle with, and, by carefully pouring down the dipper into the funnel, I have generally emptied it without spilling a single drop.

An improvement I find necessary in the apparatus, is a piece of yellow stuff sewn into the calico, to admit light when the other window is darkened by being placed against a wall; an opaque flap to button over, when necessary, should be provided.

I have taken portraits in the fields with natural backgrounds, views, and architectural subjects with this little arrangement, which, I hope, I have successfully described. For amateurs, who have not a convenient operating room, it is especially useful. My only other dark chamber was a cellar; and I much preferred using this little tent in the open air than rushing to and fro the dark lower regions as I was obliged to before I made it.

NOTE.—I did not always use silver which contained copper, because it was just as easy for me, having chemical apparatus at command, to purify it, which I accomplished by fusing in a porcelain basin; this destroys the nitrate of copper, turning it to oxide, which is insoluble. I dissolved and filtered, and thus obtained a perfectly neutral solution of pure nitrate of silver.

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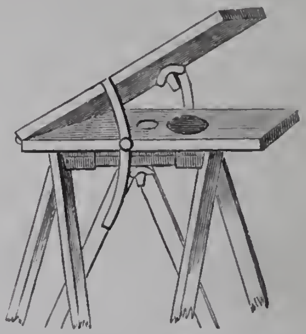
A CAMERA STAND FOR UNIVERSAL USE.

BY W. HISLOP.*

ONE of the most important characteristics of an instrument to be used in any department of art or practical science, is simplicity. Other things remaining the same, the simpler an apparatus is, the more easily is it manipulated; it becomes less subject to injury, and is also more economical in its first cost. The improvement in the camera stand, which I bring before you formally this evening, is one which I adopted some years ago, for the purpose of inclining my several varieties of copying cameras towards the sky, and subsequently, on all occasions, for any position of the camera from perfect horizontality to the vertical position. The original rough model is on the table; but for the purposes of exhibition, I have had, constructed by Mr. Hare, the neat arrangement which you see before you.



In its separate form it can be applied to any stand. It simply consists of a hinged board, the lower half of which is fixed in the ordinary way to the tripod head, and the upper half has attached two arcs of brass, sliding in clamps screwed to the lower leaf, by the aid of which the leaves can be set and clamped at any angle up to 45 degrees. If required, a scale of degrees may be engraved upon the arcs; and if a still further refinement be desired, one or both of the arcs may be toothed and be moved by a pinion with a milled head.

For portability, however, I prefer the simple arrangement before you. By turning back the upper leaf till the arcs are clear of the clamps, the whole may be folded down, and will occupy no more space than a closed book. Mr. Hare suggests that straight slotted bars with clamping screws will be more easily made, and as effective for most purposes as the arcs; he has sent one so constructed, which is also on the table.

With respect to securing the tripod, so that it shall not slip, the very obvious expedient of tying with cords is perfectly effective, and, I am informed, is used by eminent photographers. For the purposes of manufacturers, however, it may be found better to attach a leathern strap and buckle by a common screw to each leg. The end of one strap being passed through the buckle of the next, the legs may be secured at any distance apart.

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* See PHOTOGRAPHIC NEWS, vol. viii. p. 618. M. B. Renault "On the Photographic Properties of Salts of Copper."

* Read at a Meeting of the North London Photographic Association, January 18th.

The stand now described is so simple, and its construction so obvious to any practical mechanic, that I claim no credit for it, and only ask, as it is applicable to any position in which the camera is required, that it shall be called the "Universal Camera Stand."

PRESERVATIVE FRAMES.

BY M. MARION.

The preservative frame for sensitized plates by the dry process retains the usual form and construction, only on the upper portion it has an aperture to admit the passage of the sheath frames which we call preservative portfolios, and the lower strut of the frame is adherent to the shutter.

With a few portfolios, which are not at all cumbersome, we can, during excursions, carry a number of plates previously sensitized, without augmenting the photographic baggage: the changing of the plates in broad daylight is effected without the least difficulty.

With the exception of a few modifications and improvements, the principle remains the same as that we described in 1855 for the dry paper process.

The pressure-frame, which, as we have stated, retains the usual form, has its shutter furnished on the interior with a spring intended to press against the glass, and to retain it immovable in the zinc border upon which it is placed and covered with a screen; it is then introduced into the sheath, and the sheath itself, a trifle longer than the frame, is introduced into the latter, and thus projects at the upper aperture of the frame.

The glass slide, larger at its base than the sheath, exceeds the latter in length and breadth: it is by this projection that it slides in the grooves of the wooden frame; so that when the sheath is displaced under the effort of the finger, which draws it upward, the slide remains immovable, and ready for the exposure in the camera.

Strictly speaking, with our preservers, we can suppress the shutters of the printing-frame; for the preservers themselves act as shutters; but a double guarantee has its advantages, and we must at least retain them in such especial cases as where we desire to have a frame of very limited dimensions.

We have arranged our preservative portfolios in such manner that we can operate in the camera with the collodion film either before or behind the plate.

The same frame that serves to operate serves also for focussing. The ground-glass, placed in a zinc frame, is introduced, through the upper aperture, the ground side before or behind, as may be desired. If we wish to act upon the collodion film in front, we focus by placing the glass with the ground side foremost. If, on the contrary, we desire to act upon the collodion film through the thickness of the glass, we focus on the ground side of the glass, turned inwards, facing the operator. It will be understood that in either case, while focussing, the shutter of the frame must be kept open.

We have arranged our preservative frame to operate in two ways, in order to respond to a want sometimes felt of having the negative picture in its natural direction; in order to obtain the same, when in the positive frame, we print the sensitive paper through its thickness, as recommended for the carbon process.—*Bulletin de la Société Française de Photographie.*

ON CLEANING GLASS PLATES, AND ON REMOVING SILVER STAINS FROM THE FINGERS.*

BY M. CAREY LEA.

The task of bringing glass plates to a condition of perfect cleanness is a well recognized nuisance in photography, and anything which alleviates it, will doubtless be received with satisfaction. None of the methods now in use seem to give satisfactory results without much trouble. It is otherwise with that which I am about to describe, and I think I may say that no one who tries it will ever employ any other.

A convenient and large porcelain tray is to be appropriated to this purpose. In it is placed the following solution:—

Sulphuric acid	1 ounce
Bichromate of potash	1 ,,
Water	1 pint

preparing a sufficient quantity to cover as many glasses as are to be cleaned.

Glasses left in this solution over-night (except in very obstinate cases which may require a little longer treatment), will generally be found to require only rinsing off, or at most, a gentle rubbing, to be perfectly clean. Grease spots, obstinate stains, remains of old collodion, and all the other troubles, lose their hold, and the task of cleaning loses almost all its troubles.

There are certain other advantages in this cleaning bath which are worth enumerating. It has little smell, a great fault in the acid protonitrate of mercury, much recommended for cleaning. Its peculiar colour renders it impossible to confound it with any of the other baths in use about the laboratory. It keeps perfectly well. The active agents, mixed chromic and sulphuric acids, continue to exert their cleansing properties until the chromic acid is deoxidised by the organic matter removed, and reduced to sesquioxide of chromium. The operator from time to time adds a little sulphuric acid and bichromate, until after a time, magnificent, large black crystals of potash, chrome alum, begin to form on the glasses, when the bath may be rejected, and another made. Those curious in such matters may set it aside to crystallize, and collect the splendid octahedrons with cube and dodecahedron faces, and which, by turning about in the liquid, may be obtained perfectly regular, and an inch or two in diameter.

I have used this method of cleaning glass exclusively, for more than a year, and have never, in a single case, had any stain that could be attributed to imperfect cleaning. Glass even of the more ordinary kinds can be used again and again, and old plates are, except in rare cases, just as easily cleaned as new; they may be all thrown into the bath together, and after soaking over-night, and rinsing with fresh water, the one will be found to be as clean as the other.

It is a bad plan to leave clean plates to dry spontaneously, as all ordinary water contains salts in solution, which, when the water is allowed to dry on the plate, form a film, which, thin as it is, requires to be removed. Plates should be rubbed dry after washing, and for this purpose, linen or cotton cloths, so universally recommended, are far inferior to *paper;* the latter leaves no fluff, and makes a cleaner plate. Therefore, after the plates are withdrawn from the bichromate bath, I let them stand in running water until the bath solution is perfectly removed, fully to insure which, each plate is held a moment in the running stream, each side up alternately, and is then rubbed dry with clean soft paper. To economise the latter, one piece may be kept for the removal of the greater portion of the water, and another for rubbing dry; of course, as by degrees the latter becomes wet, it takes the place of the first, and a new piece is used for drying. The plates are wrapped well in paper until wanted for use. Immediately upon using, breathe on the side to be collodionized, and rub with soft paper.

I use the same bichromate solution for removing silver stains from the fingers, for which purpose it is less objectionable than cyanide of potassium, though care should be taken not to get it into cuts. In the dilute form here directed, no exaggerated care is, however, requisite.

ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

To the antiquity of the art of engraving it is not my intention to do more than allude; it is abundantly evident that it was known to the Egyptians, and used long prior to the Christian period. The art was probably one which grew out of the necessity of attaching some distinguishing mark to individual works, or from the custom of recording the history of the early ages by cutting them in stone, many examples of which have been preserved to us. Soft bodies were also impressed with the maker's marks, as in the case of ancient bricks and other plastic bodies; and thus, what was in the first instance an isolated mark, led to and become a reproductive art. From a sculptured or monumental art a refined art grew up, of which, and the perfection to which it attained at an extremely early date, the engraved gems and seals preserved in our museums give ample evidence. Engraving on metal was early employed as a means of ornamenting articles of dress; and the coins preserved to us show how the skill of the die-sinker and engraver in metal became the basis of another reproductive art. Engraved metal plates have been found in the coffins of mummies, and are preserved in the British Museum. In India engraving on plates of copper appears to have been practised long prior to the Christian period. It was there customary to ratify grants of land by deeds of transfer actually engraved on copper, and a copy of one such relic, with an English translation, is given by Mr. Wilkins, in the first vol. of the "Asiatic Researches," page 123,—an early proof of the commercial use of engraving. To trace the history of engraving on stone and metal to the period when the art of printing was discovered, would only be to repeat an oft-told tale, and tend to prove that the one object which all appear to have had in view has been to facilitate the means of reproducing, at a cheaper rate and by a more ready means, copies of the works of the artist and engraver. It has appeared to me that the present is not an inopportune time for reviewing some of the changes which have been either introduced, or proposed for introduction, during the last half century, and which have placed us in our present position with reference to the art of engraving, or its substitutes, for illustrative commercial art purposes. With a view, however, of making what I have to say more clear, it is necessary that I should state what were the the peculiarities of the art processes in common use prior to the beginning of the present century. The earliest specimens of prints from engravings were those obtained from wood blocks on which the design was cut in relief, but the art of engraving on wood, though greatly improved, continued in an extremely imperfect state till within the last half-century. The perfection to which the art had attained in the year 1803, may be ascertained by a reference to vol. xxi. of the "Transactions of the Society of Arts," in which is printed a specimen showing the great progress which the art had made at that date; and at page 13 of the Preface we find the following:—"It has been frequently asserted that the art of engraving on wood is not, at the present day, equal to what has been done by some of the ancient masters, but when the emblematical performance of young Austin in this line, prefixed to the present list of premiums, is considered as the work of so young an artist, it may probably appear that it cannot be excelled by many artists in Europe of a similar age, and the reward assigned is likely to excite his emulation to progressive improvements in that art." The reward given was the silver medal and ten guineas—and the block was for many years used by the Society as a specimen of the art, and was printed at the head of the Secretary's letter announcing the election of new members. The art was, however, carried to considerable perfection by Bewick, who applied it in the illustration of his "Natural History of Beasts and Birds," and the commercial condition of wood engraving may be seen by a reference to that work. The earliest specimen of a print from a wood block is one known as the St. Christopher, and is dated 1423.

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* From the *Philadelphia Photographer.*

* We have been favoured by Mr. Davenport, of the Society of Arts, with copy of this able paper, contributed to the Society's *Journal.* A succinct and trustworthy description of the Reproductive Arts will be read with pleasure by photographers.—Ed.

The earliest use of engraved metal plates in England probably dates from the time of the Conquest, but Mr. Strutt states that he has not seen any with a date prior to 1284. They were then used as monumental brasses or tablets, and were executed with the graver, and are assumed to have been produced by ecclesiastics. The same principle which was applicable to the production of monumental brasses, viz., the removal of a portion of the surface a metal plate by cutting it away, according to any desired design, by means of the graver, was applied by goldsmiths in the production of Niello work. The earliest known print from a metal plate is one which can be seen at the Imperial Library, Paris; it is attributed to Tomaso Feneguerra, the Florentine goldsmith, and bears the date 1452, and the earliest known book illustrated in this way bears date 1478, and was printed at Rome. The next step in the improvement of the art of engraving is said to have taken place at the beginning of the sixteenth century, and is attributed to Albert Dürer, to whom is ascribed the invention of the art of etching, or drawing with a metal point or tracer, upon a plate, the surface of which was covered with wax or varnish; and the etching or drawing being afterwards permanently engraved in the metal plate by the action of the acid. The process of etching afforded an opportunity of exercising any required amount of freedom of hand in the production of foliage or landscape, and soon led to a combination of the two processes, and was the means by which engraved copper-plates were usually produced at the beginning of the present century. This process is known as line engraving; it is a slow, tedious, and costly means of copying works of art; its peculiarity is, that it affords facility for giving a large amount of drawing and minuteness of detail, at the same time that it admits of the greatest possible gradation of light and shadow, and the most perfect artistic effect. The process of etching was largely used by Rembrandt. The most perfect works executed in the early days of this art are, however, to be found in the portraits and historical subjects, for the reproduction of which it was especially suited, though in later times it was largely and most effectively employed in the copying of architectural, monumental, and landscape art. Copper-plate engravings were printed in England, in "Vesalius's Anatomy," as early as 1545, but the English school of engraving cannot be said to have existed till about the middle of the eighteenth century, at which period efforts were made to advance the interests of artists in this country. It was during the reign of George III. that the Royal Academy was established, and as art advanced, so with its advancement grew up the use by our artists of the etching point and the graver in a more refined and skilful manner. But the mere reproduction of copies of pictures from engraved plates printed in black inks did not long continue to satisfy the public, and efforts were soon made to print in colours from these engraved plates, but no thoroughly satisfactory results were obtained from line engravings in this direction, and recourse was had to the next process, to which I shall call attention.

Line engravings were executed (as before stated) by cutting away the surface of the copper-plate by means of the graver, which, for this purpose, was made concave in its length, and varied from a square to a thin V-shape in its width, thus enabling either a narrow or a broad line to be cut, while by a slight variation of pressure, or by depressing the hand of the operator, the point of the graver was gradually driven along the metal or freed from the plate altogether.

CHALK OR STIPPLED ENGRAVING, the next process to which I have to refer, was, on the contrary, executed by means of a graver of an arched or convex form, which when applied to the copper-plate could not relieve itself from the surface of the metal, the whole tendency, wherever pressure was applied, being to thrust itself deeper into the metal, leaving a punctured dot, varying in breadth or delicacy according as the graver itself was more or less square or V-shaped on its face. This mode of puncturing the face of a metal plate was known as "chalk engraving," from the clusters of dots being so arranged as to imitate the granulated effect of lines drawn upon cartridge paper with Italian chalk. This process was especially suited to portraiture, or groups of statuary, owing to the softness of its gradations from light to shadow, and the production of an equal grain over the entire surface of a piece of metal. It was ill-adapted, however, to the production of landscape effects.

(To be continued.)

NEGATIVES IN THE EYE—GHOSTS.—(*Continued.*)

BY PROF. TOWLER.*

As addenda to what we have already advanced upon this subject receive the following:—

Let a coloured engraving be well illumined by gaslight, and then intently observed by looking at a single point for about a minute; now extinguish the light *nearly* (the light is behind the observer), so that the white wall of the room is partially visible; in this case the coloured engraving will be visible in its complementary colours on the wall, and since the wall is supposed to be much more remote than the engraving was when it was regarded, the picture, subtending the same angle as before, and being more projected or delineated on the wall, will appear immensely magnified. If the eyes be closed, the picture will have the same apparent size as the engraving; or if the gaslight be quite extinguished, and perfect darkness be produced, the image will not be magnified.

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* From *Humphrey's Journal.*

If a coloured engraving be observed only for a moment, and the eyes be closed, the picture will appear for a moment in its true colours.

It has been asserted by many physicists that if a substance appears red, green, &c., it is because these colours are reflected whilst the remaining colours of compound light have been absorbed. But in our present experiments, red appears green, green red, &c.—what becomes of the theory?

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HOW TO VARNISH THE EDGES OF A NEGATIVE

BY PROF. TOWLER.*

In dry-plate photography it is an invariable rule, if the plate has no substratum of gelatine, gutta-percha, or albumen beneath the collodion film, as also in the wet collodion process, when the plates have become dry and previous to intensifying them, to proceed around the edges with a narrow strip of varnish. Now, how is this to be done, and done easily?

There are various ways of accomplishing the task. We regard the following as the easiest and the best; whoever knows a better plan, be generous and send it to the journal, which is always the friend of the needy.

Take a piece of hickory about six or eight inches in length, and cut it round like a pen-holder, but much finer. Next select a camel's-hair pencil of medium size (the quill part being that of a duck or hen). This pencil and a cedar pen can be bought together, in which case it will not be necessary to cut out a hickory handle. Bind the pencil to the handle *side by side* and in such a position that the hairs of the pencil terminate on a level with the termination of the handle. Fix this combination in a cork belonging to the varnish bottle, and of such a length that the pencil dips into the varnish.

When about to use this varnish brush, lay the negative, collodion side upwards, on a large plate of glass kept for the purpose: now take out the brush charged with varnish, and, bringing the stick part up to the edge and all the while resting on the plate of glass beneath, whilst the hairs of the charged brush rest on the edge of the negative, proceed along one edge; then charge the brush again with more varnish and go along the next edge in like manner, and so on to the place of beginning.

It will be observed that the brush, by this proceeding, touches only a small strip all the way around, which can be made larger or smaller by increasing the size of the camel's hair pencil.

By making use of the glass plate beneath the negative, it will be seen that the edge can be varnished all round without even touching the negative, which is afterwards reared on one corner to dry. The plate, however, may be dispensed with, in which case the pencil has to fixed so that the end of the handle or stick, to which it is attached, projects about half an inch beyond the termination of the hairs of the pencil. This projecting part then becomes a guide against the *lateral* edge of the negative, whilst the pencil itself is drawn along the *surface*-edge of the negative.

Both plans are expeditious and equally effective. We are indebted to H. T. Martin, Esq., for the latter plan, which we have modified for our own convenience and taste. The varnish for dry plates which he uses, previous to coating them with collodion, consists of:—

Albumen	1 ounce
Water	2 ounces

Camphor—a small lump.

The camphor is introduced as a preservative for the albumen, which so prepared may be kept an indefinite time.

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* From *Humphrey's Journal.*

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Proceedings of Societies.

North London Photographic Association.

The usual monthly meeting was held in Myddelton Hall, on the evening of Wednesday, the 18th inst., Mr. G. Dawson in the chair.

The minutes of a former meeting were read and confirmed.

Mr. W. Hislop read a paper describing a convenient form of camera stand, which was as simple as it was efficient (see p. 33). The stand was exhibited and elicited much admiration. Mr. Hare showed another made on the same principle, but with straight slotted bars of brass instead of the arcs of brass first adopted. Mr. Hislop said the straight bars would pack more easily, and answer every purpose for a light camera, but would not support a heavy one so well as the curved bars.

The Chairman read a note from Mr. Solomon, calling attention to a camera stand having many of the movements of that described by Mr. Warner. It was not new, but one he had been selling for some time. Mr. Grant exhibited the stand, which had many convenient movements, but was not so portable as Mr. Hislop's stand.

Mr. Bockett referred to the old ball and sockett camera stand, which he thought answered every purpose. Mr. Hislop's was a very convenient stand; but thought it would be an improvement if the tops revolved, so as to allow the camera to be moved round easily.

Mr. Hislop showed that the camera itself moved quite easily by revolving round the screw by which it was attached to the upper part of the head of the stand.

Mr. Hill said he thought nothing could be more simple, efficient, and portable than Mr. Hislop's stand. He saw no want but what it would satisfy.

Mr. King thought that members ought to be very much obliged to Mr. Hislop for bringing before them a stand which would effect every object so well, and without complication in manufacture or working. All unnecessary complications he thought ought to be most specially avoided. He had no doubt that Mr. Hislop's stand would be adopted in preference to any other.

Several other members expressed their approbation of the efficiency, simplicity, and cheap form of the stand.

The Chairman thought some conditions were wanting to constitute it a universal stand. It could not, for instance, be turned so as to permit the camera to be quite perpendicular, so as to take a picture on the floor.

Mr. Hislop placed the camera in that position to show that it could be so placed.

The Chairman said the legs of the stand would be included in the picture.

Mr. Wharton Simpson said he presumed it was quite clear that Mr. Hislop could not take a picture which was underneath the legs of the camera stand.

Mr. Hislop said he certainly could not do that.

After some further conversation, in which the Chairman, Mr. Hislop, Mr. Bockett, Mr. Hill, and Mr. King took part, in which a general recognition of the advantages of the stand were admitted by all, a vote of thanks was offered to Mr. Hislop, and the subject dropped.

Mr. S. Highley then exhibited, by the aid of the magic lantern and the oxyhydrogen light, a large number of very interesting transparencies, consisting of microscopic objects from the negatives of Dr. Maddox, street scenes, &c., from the negatives of Mr. England, wild beasts from the negatives of Mr. Haes, reproductions of Kaulbach's designs to Reynard the Fox, Schnorr's Bible pictures, &c.

After a vote of thanks to Mr. Highley, he stated, in answer to a question, that he developed his transparencies with iron.

Mr. Bockett said that he found that the image given by iron, when much magnified, appeared granular, and he knew some entertained the opinion that a finer texture was obtained by pyro development.

The Chairman said he thought that pyro gave a finer film than iron, and gallic acid a finer still.

After some further conversation, Mr. King suggested to Mr. Highley that some of Albert Durer's subjects would be interesting and useful for the lantern.

Mr. Highley said unfortunately such subjects were least popular, and sold least.

Mr. Grant then exhibited some of his improved lamps for the magnesium wire. A test of the relative strength and purity of the magnesium light and the oxyhydrogen light was then made, by burning them side by side, examining both the naked flames, and the amount of illumination they cast respectively on the screen. The brilliancy, purity, and actinic character of the magnesium light was immeasurably superior to that of the oxyhydrogen flame, which looked orange coloured by comparison.

After some conversation on the subject, the proceedings terminated.

Correspondence.

COPYRIGHT IN ENGRAVINGS.

Sir,—The insertion in No. 330 of the strictures from *The Standard* on the piracies from prints, having called forth many severe criticisms from yourself and your correspondent "Detector," not altogether just, I will, with your permission, endeavour to supply a few links in the evidence, and so render the case more complete, that a correct judgment may be arrived at. Tracing back to the course adopted in the time of Hogarth, we find that all his works were generally published with the full title of the print and the publication line as required by statute, and the earlier impressions are known and valued by the absence of certain variations and additions found in the actually finished plates, as in "The Strolling Players," additional cross hatching is found to have been made in the hole in the roof of the barn: in "The March to Finchley," Prussia is spelt with only one s, an error subsequently corrected; variations are also traceable in the majority of other plates. These variations may be ascribed to the fact that Hogarth, being his own publisher, had them always under his eye, and made the alterations with the intention of rendering them more perfect, although they are now esteemed as the most valuable, furnishing evidence, as they do, of the priority of impression: and when you consider the material upon which they were engraved, copper, the number of really fine impressions was very limited; but impressions of some of his plates exist *without any writing at all.*

We then find that it was the custom with many engravers to put the title and publication line before delivering the copper-plate to their employers, the print publishers, so that no impressions without the letters of certain plates are known to exist: but the publisher invariably put the publication line where the title was omitted for "proofs before the letters," and very few even then were printed, which accounts for the high price of many works in that state; this was even done so near our own time as by John Burnet with some of Wilkie's works. "The Jew's Harp" is one instance, the early proofs of "The Blind Fiddler" are known by the absence of the cross hatching on the hat of the boy aping the fiddler with the bellows as a fiddle; and till within these eight-and-twenty years "artist's proofs" were only known as those in possession of the engraver, six or eight of the finished plates being claimed by him as a right, *but not for sale;* and many of the earlier engravings, after Landseer, bear the engraver's publication line before they passed into hands of the publishers. "The Highland Shepherd's Grave" and "Chief Mourner," by Gibbon, and "Little Red Riding Hood," by Robinson, may be quoted. "Bolton Abbey" is not known in a published state without any letters, the date of May 1st, 1837, having been first inserted, and altered, when only eight or ten impressions were taken, to May 9th, in compliment to Mr. Samuel Cousins, as the date of his birthday. The early proofs, after Turner's works, also command high values; some of the small proofs from the "Liber Studiorum" are worth five guineas each, and the earliest finished proofs of "Ancient" and "Modern" Italy "have the large etching title of the subject to them, but not exceeding six or eight impressions were taken in this state; this title was taken out, and proofs without any letters *at all* printed as "artist's proofs," and so on with many more of the engravings from his works; these proofs having, by death, presentation, or other means, got into the market, irrespective of the publishers, were eagerly collected. And proofs, in unfinished and unpublished conditions, of the works of engravers from the time of Hogarth, are continually met with; thus proving that it is no modern practice. Hogarth, Strange, Woollett, Bartolozzi, in fact, no exception can be found, in one form or another, as the folios at the British Museum will prove.

Such was the state of things up to that time, when there arose the fashion of exhibiting the pictures prior to publication and obtaining subscribers' names; and the desire of possessing the earliest proofs having arisen among collectors who had acquired many of these genuine early proofs. The demand was excited for proofs in similar condition, and the introduction of steel plates enabling a much larger number to be printed, the earliest impressions were taken without letters, and called "artist's proofs," for which, as you say, an enhanced price was obtained: but, at the possible sacrifice of the protection afforded by the Acts of Parliament, this was, however, of little consequence, if even thought of. No means of copying existed then which at all alarmed the publishers; and the early productions of photography certainly gave no indications of the vast power of the youthful art; but as it has developed itself, it shows that it can not only copy faithfully, giving you every touch of the engraver, but it can also do its work cheaply and quickly; is not liable to the wear and tear of a steel plate, so that, with ordinary care, it will give you as perfect a copy at the tenth thousand as at the first. Where, therefore, the photographer finds a print issued and sold by a *publisher* without the security of the publication line, there, it may be urged, that no penalty can be exacted; but I think that if he should obtain a working proof of the engraver's without letters, and the publisher could prove that no impression had been sold by him without the publication line, the law would certainly protect him, as he has no control over the plate until it is in his possession, nor is it till then in a saleable condition: and with plates of high finish, many such proofs must be taken for the guidance of the engraver, and which ought to be destroyed on the completion of the work. But the publisher contends that, as proofs are not mentioned in the Acts of Parliament, he sufficiently complies with the statute by putting his name and the date of publication to the *prints* (the word used in the Act), although the existence of proofs must have been well known to all parties concerned in the framing of the Acts. "Detector" boldly states, that the absence of the publication line to any impression vitiates the contract made by the legislature with the publisher. You, sir, seemingly coincide in that view; but you must recollect that as yet we have had no interpretation of that point by any superior court of law; consequently, it is at present only a matter of opinion, shaped as each party desires it to be; one thing you must admit, the publisher has borne all the cost, his engraving represents so much money, and I submit that he may reasonably object to whatever may interfere with his obtaining a fair return for that expenditure, if his property is protected simply by statute only.

Now, the difference between the true "artist's proofs" and the publisher's "artist's proofs" is, I hope, apparent from the foregoing; the one class is limited to the property or right of the engraver, the other is truly only the earliest and best state of the plate as published, and is a misnomer as far as "artist's proof" is concerned. In reference to "the Printseller's Association," this body arose from a meeting of the trade to take steps against "Art-distributions," or lotteries commenced by Mr. Boys and Mrs. Parkes, which led to the legalisation of Art Unions, but stopped all the "little goes" then springing up. An evil having been felt to be encroaching in the over-printing of proofs and in the ignorance of how many were really printed, it was then thought desirable that a declaration should in future be made as to the number of proofs to be taken from engravings then commenced, which should be stamped by their officer, and no more, that no proofs without such stamp should be saleable by the members, and that they would not recognize any prints published without such guarantee to the Association; but they did not strike at the root of the evil, which was over-printing; and publishers finding how profitable it was to exhibit pictures, and in the midst of the excitement and glare of gas-light how easy it was to obtain subscribers, declared, for such numbers of "artist's proofs" as must have materially affected their sale had they been known to the world, even exceeding the number stated for "Eastward, ho!" not but what I think they were rarely printed, but they were ready to supply any demand which their "curator" might obtain by the exhibition; but by this system another evil was generated, the demand was pretty well known and was fully met; consequently, instead of proofs rising in value we had them falling, and engravings were not always produced to sell by their merits, but to supply a factitious demand, and that supplied, the plates were sold to those who quickly disseminated them through the country at such prices as disgusted the original subscribers, and warned them to be more careful in future in subscribing to pictures, dazzling in colour, and attended by loquacious gentlemen *particularly anxious* to make good lists. With regard to the issue of reductions from large prints, there can be no doubt but that the public would be pleased to get them, and in many instances they might pay, but you overlook the fact that all the heavy expenses must be incurred before you can reduce, the return for which can only be looked for by the sale of the larger engraving; no doubt photography offers the best means of giving you faithful transcripts of the works of the engraver; but as we know that it is true, as stated by the *Standard*, that "small fortunes" are now invested in copyrights and engravings by publishers, and that as a rule, good taste, large capital, and matured judgment are required to carry on the business successfully, considering also how few pictures out of the number exhibited every year are taken up by the publishers; surely, with all their faults of omission and commission they might be left to manage their affairs as their experience tells them will best repay them for their enterprise, and if they are wise enough to fulfil the requirements of the statutes in their favour, they may justly complain of the piracies both in photography and in lithography, which are sold throughout the country; let the photographer be content with those works in which the copyright has expired; but if he seeks to elevate his art and to make it respected among its many patrons, let him employ his taste, capital, and judgment in direct dealings with artists, and let him produce original works, he will then avoid these unseemly squabbles about copyrights; such is the course pursued in Paris by M. Bingham, and no doubt it might be made to pay here. As "Detector" admits, there is no efficient remedy against a large class of the pirates, let all parties unite to seek such an alteration in the law, that where there can be no doubt of the piracy being a *direct copy* of a protected work, whether in painting, engraving, design, model, or photograph, inasmuch as such piracy invades a property recognized by law, and involving important interests; give the law power to punish such an invader by criminal prosecution, so that if it cannot touch him in purse let it have power over his person by imprisonment with hard labour. Let the law also confer the power of direct seizure where seen, or under a magistrate's search-warrant where suspected to be kept in stock for sale or production. Such powers as these might check a great evil, and looking to the present interests and to the growing interests of art in this country, it is not too much to ask of the Legislature to accurately define the rights of all parties interested.—I remain, sir, yours obediently, J. S. W.

[With much in the interesting letter of our correspondent we agree; but we are also compelled to demur to much, into the details of which we cannot enter at length now. He must distinctly remember that the law provides a definite means for securing the copyright in an engraving. If the print publisher neglect to avail himself of the means, he does so, for a definite consideration, and cannot fairly grumble at the result: in short, he cannot have his pudding and eat it. We so object to anything like piracy, that if a moral right to the property could be shown, apart from the right conferred by statute, we should consider that moral right sacred. But the history of the print trade is not of such an impeccable character as to excite much sympathy of this kind. Print publishers have for the most part arrayed themselves against photography as an innovation to be maligned or opposed at all hazards. They have thus endeavoured to retard the popularising of art. We do not believe for one moment, the sale of small photographic copies of engravings would interfere with the scale of the large engravings themselves, but would rather increase it by advertising the pictures. We know that fortunes have frequently of late years been invested in copyrights of pictures, to which a factitious value has been attached as the result of a bad system which has been growing, the copyright often commanding a greater price than the picture itself. Our correspondent will see that Vice-Chancellor Kindersley's view of the law corroborates that we laid down.—Ed.]

Photographic Notes and Queries.

Manufacture of Oxygen Gas.

Sir,—I am sure your numerous readers are indebted to you for giving so much space to the subject of oxygen gas; and those especially who are working with that gas, will join me in thanking you and your correspondents for the information that has been given. Mr. Henderson has given an apparatus that is evidently quite safe, and very clean; would he tell us, do you think, what quantity of chlorate and sand he puts into his retort for an ordinary sized bag, and what heat he applies. An answer in correspondents' column, will oblige yours, Thankful.

Talk in the Studio.

Old and New Processes.—A correspondent, in Otago sends us the following, referring to an extract from our answers to correspondents, in a copy of the News which he had just received; his comments and explanations thereon will amuse English photographers. The answer was one addressed to a correspondent signing "Jonathan," who asked if we could inform him of the nature of the Sennotype, a class of picture having some marvellous properties, he had been informed, and of which we told him we had never heard. "As the people at home seem to be, in most matters, a few years behind the rest of the world, perhaps some photographer may give something for the ensuing information concerning the sennotype process, which has been in vogue here for a year or more, although there was no demand for such pictures in the street I was in. Print a picture on plain salted paper, which is best for the purpose, make it transparent like tracing paper (I think with white wax and dextrine, but how, is not of much consequence, as long as it is light coloured and transparent) and stick it on to the back of a plate of glass, lay this evenly over another copy of same picture, roughly and highly coloured with chalks or otherwise, also with a glass in front of it, and fasten them up. The said picture seen through the transparency and glasses has a peculiar diaphanous appearance, exactly like an ivory miniature.—E. A." The process here described is one of the oldest methods of photographic colouring. As we stated in a recent article (see last vol. p. 544) it has been patented over and over again in this country, and we believe also in America.

Obituary.—We have to announce with deep regret the deaths of two of the most distinguished amateurs associated with our art. The Viscountess Hawarden, whose charming pictures have won such deserved admiration at the last two photographic exhibitions, died at her London residence on the 19th. The second death is associated with more melancholy circumstances. Mr. Lyndon Smith, of Leeds, an amateur of much skill and artistic feeling, whose pictures were very familiar to visitors at former exhibitions, and whose name is not unfamiliar to readers of the journals, was drowned, a few days ago, whilst attempting to save the lives of others jeopardized by the breaking of the ice. A favourite piece of water for skaters, a few miles from Leeds, known as Benyon's Pond, in the grounds of Gledhow Hall, being frozen over, was, on Monday, the 23rd, the resort of about a hundred persons, skating, sliding, and looking on. A young lady of sixteen, Miss Bulmer, was being pushed over the ice in a chair by Mr. Broughton, which originated the accident. We quote the *Leeds Mercury* for details. "No indications of weakness in the ice had exhibited themselves, but as the chair reached the end of the pond nearest Leeds, where it is stated a spring or drain exists, and where, therefore, it would naturally be weakest, there was a crack, the fragile support suddenly disappeared, and Miss Bulmer and Mr. Broughton sank beneath the surface of the water. Instantly an alarm was raised, and several of the skaters hurried to the spot. Foremost amongst them was Mr. Lyndon Smith, who, in his gallant efforts to save the life of others, sacrificed his own. He fell into the water, the depth of which, unhappily, was so great that he was unable to extricate himself. Others fell into or entered the water in the hope of rendering assistance, and one of them, a gentleman named Jackson, by the aid of a stick, succeeded in rescuing Mr. Broughton, but, unfortunately, neither Miss Bulmer nor Mr. Smith could be reached. The body of Miss Bulmer was first recovered, and afterwards that of Mr. Smith. Mr. Hey, surgeon, who resides near, in the meantime had arrived, but as the bodies had then been in the water for nearly two hours, it is needless to say that any attempt to restore life would have been altogether fruitless. Mr. Lyndon Smith, who was a partner in the firm of William Smith, Son, and Co., woollen merchants, Cookridge Street, Leeds, also occupied a distinguished position as an amateur photographist. He was about thirty years of age, and leaves a widow and three children." Mr. Smith, if we remember aright, took the first medal given by the Photographic Society of Scotland, the award being for "The Rising Mist."

PHOTOGRAPHY IN COLOUR.—A Mauritius paper says:—"Photography has entered upon a new and unhoped-for path, and Mauritius enjoys the honours of this progress, thanks to M. Chambay, a true adept in photographic processes, who has resided many years amongst us, and obtained great celebrity for his views and other productions. M. Chambay has succeeded in fixing the colours of the object: the picture is taken instantaneously, as in other kinds of photography: the modelling and relief are marvellous, the blood appears to circulate beneath the skin, the colour is fixed, and the portraits, which present a surprising resemblance, are equal to the finest pastels, miniature, or water-solour drawing. M. Chambay is about to remove to Paris, where he will certainly create a revolution, not in the political, but in the photographic world."

A PHOTOGRAPHER'S DOOR-PLATE.—In a recent case, Mr. Fillan, photographer, 73, Oxford Street, the upper part of which house he rented, tried his right to place his name on the house, of which defendant, Mr. Pulvermacher, held the lower part. In the course of last year, it became necessary to paint the premises, and the plaintiff, in the course of the work, had his name written on the upper part of the front of the house, just below the glass building, which he used for his business. The defendant, however, had it painted out, and restored his own; and the plaintiff having afterwards put up a piece of zinc with his name on, the defendant removed it, and this action was then brought to try the right. After some evidence it was arranged that a juror should be withdrawn, upon the understanding that the plaintiff should be allowed to have his name up.

PHOTOGRAPHY IN JAPAN.—The *Morning Star's* Paris correspondent says:—Parisians are tired of photographs. To attract their attention even to those of such celebrities as George Sand or Victor Hugo, they must be the size of life, and even then a passing glance is all they obtain; but in Japan, it appears, the excitement created by the *portraits-cartes* of the Imperial family brought out by the Japanese Ambassadors has not yet subsided. An immense order has reached Paris for photographs of all the European Royalties. This good news has spread like wildfire among despairing photographers, and no less than two hundred are about to start for that remote region, inspired by the bright idea of illuminating the barbarians by the latest rays of scientific discovery. May the sun of Japan shine on them, and their shadow never be less.

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To Correspondents.

FEARFUL.—You may use the glass with safety for a window open to diffused daylight only. If direct sunlight enter, an orange glass would have been better. But this may be used, with a yellow blind, when the sun shines.

W. MAY.—The general plan of your projected washing apparatus is excellent. The only suggestion we have to make is to this effect:—Add, if possible, a syphon arrangement, by which, when the trough is quite full of water, it will become emptied, and remain so for a few minutes. If this process be repeated once or twice in an hour, during six or eight hours, you will secure very perfect washing. The draining which the prints will receive in their vertical position each time the trough emptied, will be of the most vital importance in removing every trace of hypo. We shall be glad to hear details, and how the apparatus succeeds when complete.

AMATEUR AND SUBSCRIBER.—No. 1 appears to us best suited to your wants.

INQUIRER.—The cause of cracking in the film of varnished negatives is not quite satisfactorily established: damp is a common cause, and still more frequently damp and frost. The imperfect washing of the film after fixing and before drying, often conduces to this defect. In the negative sent, we notice that the crack appears in all cases to have originated at a point where there was a pinhole; the film flying in various directions from that point. Keeping the negatives at an equal temperature and dry will generally prevent the cracks, and the vapour of alcohol will repair them. For details of the causes in operation, and of the mode of restoring the negative, see pp. 373, 375 of our last volume.

HARRY DIXON.—To intensify the varnished negative, first moisten the varnished film with alcohol; pour that off, and then apply tincture of alcohol, that is iodine dissolved in alcohol; strength about two or three grains to the ounce. As soon as the deposit assumes an olive green tint, wash off with alcohol. No water must be used at any stage of the process. 2. Iodine is soluble in alcohol, but not in water. If an aqueous solution be required, the addition of twice its weight of iodide of potassium will cause it to dissolve in water; but this is not applicable to a varnished negative. 3. A transparency is a positive by transmitted light, clear glass forming the lights, and the deposit of silver the shadows. If you expose a collodion plate under a negative for a few seconds, and then develop, you will obtain a transparency. 4. For new glasses we use either alcohol alone, or alcohol and tripoli. For glasses which have been used, either old iodized collodion or dilute nitric acid, followed by alcohol and tripoli. 5. The test paper should dry of a slightly red colour. You need not apologize: it is not a "trouble" to answer our correspondents.

G. BRUCE.—Various causes have been suggested for the blistering of prints, and various remedies proposed: but we are not perfectly satisfied with any of them. The only certain remedy we know, consists in using *Saxe* paper instead of *Rive*. The thick *Rive* papers are very subject to this blistering, *Saxe* papers rarely or ever. The discolouring to which you refer is probably due to imperfect fixation.

NOVICE, E. B.—With the background attached to a wall looking north, and with a canopy and shelter at each side projecting six feet, you will doubtless be able to produce good open-air portraits.

Z. Y. X.—In your case the side-light should come from the north, and should extend from the roof to the ground. You would work much more rapidly if your glass had been extended two or three feet further, and so have reduced the dark part for the camera. 2. A very slight trace of nitric acid is best for a negative bath, with acetic acid the bath is much more easily deranged, and more difficult to rectify.

D. D. D.—See our first article. 2. A Lerebour's half-plate lens may be used for buildings if well stopped down. A triple lens is best for the purpose.

G. W. T.—The best quick-working bath is one made of pure nitrate of silver, and as nearly neutral as possible. For this season of the year, the strength should be 40 grains to the ounce; for summer, 30 grains. Various additions have, from time to time, been proposed to gain greater rapidity; but we do not know of any which is of any permanent value; most of such additions eventually spoiling the bath. If such a bath yield plates which are insensitive or wanting in vigour, the fault is probably due to the collodion. A pure bromo-iodized collodion, of good body and freshly made developer of sulphate of iron or saccharo-sulphate of iron, should work satisfactorily. A dull light and cold weather tend to produce thin grey images. A good light, full exposure, and development with a solution of iron, having plenty of acetic acid, will tend to produce a warm non-actinic tone in the image.

J. F. N., Walsall.—We forwarded the cards with brief remarks on each. It is difficult at any time to give the exact rank as to quality in the way you desired, as each picture may excel in some point, and be wanting in others; and a combination of good qualities alone can constitute excellence.

C. B. P.—We fear there is no method of joining a broken glass positive, so that it will not show. The gum may possibly be removed from the surface of the crack by the gentle and skilful use of a camel-hair pencil dipped in lukewarm water.

EDGAR ANOLPHE.—We do not know the present address of the gentleman you mention, but will endeavour to ascertain and let you know.

GEORGE WILLIS.—We shall be glad to see the specimens to which you refer, and shall then have pleasure in giving publicity to your views, together with some comment thereon.

J. H. MORI writes to state that he has been experimenting with chloride of siver in collodion for 15 months, and thinks that whatever credit attaches to the discovery should belong him. He overlooks the fact that an unpublished discovery is, so far as the public are concerned, a dead letter, and is practically as if it had no existence. If he made such a discovery he was very imprudent not to make it known in some way if he desired to claim the credit of it. A thing once published has an established date for reference, and is placed beyond doubt or cavil. When it rests on the *ipse dixit* of any one, it is always open to doubt. The deponent's word may not be doubted, but his memory may, and all kinds of discrepancies occur, such, for instance, as that in the letters he sends us: he says he has used the process for 15 months; his employer's letter says 9 or 12 months. He says that he did not publish because his employers wished it for the time to be kept secret: they say that they were not aware there was any novelty in chloride of silver being suspended in collodion. We are not in the least doubting his word, but merely showing how uncertain the data become without publication. We have experimented in this direction for about 6 months, and we claim for ourselves the discovery, and its publication in October last. Our correspondent may, we doubt not, have been an independent discoverer, but he has lost the claim to absolute discovery by non-publication. We are glad to hear of his operations, and shall be glad to see some of his results, and also to receive the details of his method, which he kindly promises for the benefit of our readers. At present there are various gentlemen earning a share of the credit by skilful experiment in working out the best details. We may especially mention our esteemed contributors Mr. H. Cooper, and the "Photographer's Assistant;" the latter gentleman is making some valuable modifications, of which he has forwarded us some very fine examples. Our own results have been very satisfactory; but every new process is better for the aid of many in bringing it to perfection.

G. W. S.—Thanks for the extract, of which you will see we have made use.

W. CALLAWAY, Bristol, sends us a print by our collodio-chloride of silver process, and one from the same negative on albumenized paper; both are good, but, as he observes, that by our process has more half-tone and modelling. The only difficulty he finds is somewhat slow toning. We shall be glad to hear further from him on the subject.

Several communications are compelled to stand over.

Several correspodents in our next.

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GODDARD TESTIMONIAL FUND.

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THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 335.—*February* 3, 1865.

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A NEW METHOD OF PHOTOGRAPHIC PRINTING ON IVORY AND WOOD.

The delicate and transparent effect of water-colour painting on ivory has always rendered this substance a favourite for the production of the highest class of miniature paintings, and ever since the introduction of photography, to supersede the old system of portraiture, efforts have been made to secure the photographic image on ivory. Even in the days of the Daguerreotype attempts were made in this direction. The instructions were, that the tablet of ivory should first be immersed in nitrate of silver, then blackened by light, and next treated like a Daguerreotype plate. We never tried the process; but it always struck us as a very unpromising one. When the processes of photographic printing on paper were introduced, various methods of adapting the same principle were adopted, for the most part with small success. Modes of making and using artificial ivory for photographic purposes were devised. Several methods were patented, many more were preserved as secrets; but notwithstanding this, a photograph of any kind on ivory was rarely seen, still more rarely was a good one to be met with.

The first really practicable method of printing on ivory ever published was contributed to our pages by Mr. Samuel Fry, (p. 171, vol. v.) and we have seen very excellent pictures produced by his method. A secret method, one of the iron processes being, we believe, employed, was practised for the profession during some years with considerable success. A method of using an iron process was some months ago contributed by Mr. Lawrence to the *Philadelphia Photographer*, by which a print of a blue colour was obtained, which, unless very light in tint, is scarcely a desirable colour for the miniature painter to work on.

We have recently been engaged in some experiments by which we have been enabled to produce excellent prints on ivory, by a method which is, we think, more simple and easily worked than any of the previous methods; the process we have employed being the Wothlytype, which for this purpose appeared to leave nothing to be desired. We have used a collodion made from a somewhat powdery pyroxyline, saturated with nitrate of silver, and containing about four grains of nitrate of silver to each ounce. A tablet of ivory prepared for miniature painting is coated with this collodion, and exposed under a negative. It prints somewhat more slowly than paper, tends to produce a more vigorous image, and requires very little over-printing, especially if submitted to a bath of dilute acetic acid before toning and fixing, for we find that with Wothlytype prints the image is much less reduced during toning and fixing if it have been submitted to the bath of acetic acid and water first. By remaining in this solution five or ten minutes, the uranium salt is dissolved out of the film, and the print may now be submitted to the action of a toning and fixing bath, consisting of gold and sulpho-cyanide of ammonium, such as we have before described; or it may be toned in a bath of chloride of gold and acetate of soda, and then fixed in a solution of sulphocyanide of ammonium, one part in ten of water. We have tried both plans, and with ivory have obtained the best results by using the acetate bath. A thorough rinsing completes the operation.

When the picture is completed and dried, it possesses, of course, a surface of collodion. This, to some colourists, would not be regarded as an objection, the collodion surface being a very pleasant one on which to colour; but for those who desire the peculiar surface of the ivory itself, the collodion may be easily removed. A few drops of ether are poured on the surface, and the film removed with a tuft of cotton wool; the surface is finally rinsed with ether to remove the final traces of the collodion, and the picture is finished. It will be found that notwithstanding the removal of the collodion, the image is not impaired, but remains vigorously impressed on the surface of the ivory itself. If the film of collodion were thick and of a horny character, the tone of the picture on the ivory will be a little redder than before the removal of the film, but with a porous, permeable collodion, the toning action appears to pass completely through to the ivory itself.

So far as the process is concerned the operation is perfectly easy, and there appears to be no difficulty in getting good results; but there is one source of failure to be guarded against, which is in the preparation of the ivory itself. In our first experiments we used the tablets of ivory as sold by the artist's colourman, ready prepared for miniature painting, the surface being apparently everything that could be desired. When the picture was finished, however, we were wofully disappointed; by some means or other a factitious surface had been given to the tablet, without really removing the saw marks, which now appeared in deep but fine ridges, quite sufficient to spoil the effect, and to give the appearance besides, of a print which had not been in proper contact with the negative in the pressure frame.

In subsequent operations we found it desirable to prepare the ivory ourselves. This is very simply done. A suitable piece having been selected, as free from grain as possible, all traces of saw marks must be removed by means of a steel scraper or a piece of glass. This being done, the ivory is placed on a piece of board, a few drops of clean water, and a little very fine pumice powder quite free from grit applied. The surface is then carefully smoothed by this, rubbing all over with a circular motion. A glass muller is the right thing to use we believe; but we have found a new bung cork answer admirably. When every trace of mark or scratch of any kind is removed the tablet is ready for use. If a little cuttle-fish bone in powder be used dry to finish with, the texture of the surface will be improved.

There is, of course, a difficulty in printing on ivory not easily overcome entirely. It cannot be turned back like paper in order to examine the progress of printing. Mr. Fry, in the article to which we have referred, describes a very ingenious mode of attaching the ivory to the negative by gummed paper, which will permit the printing to be examined without much risk of moving the tablet. We have found, however, that if it be thin and care be used it is possible to raise it up sufficiently to judge of the progress without any danger, and have done so in all the experiments we have tried.

It is important to remember that for the purposes of the miniature painter, a light, delicate, sharp, impression, as full of detail as possible, and without dark shadows, is required. A soft negative will generally answer the purpose best.

By using the same manipulations throughout, employing a prepared block of boxwood, the photograph may be printed on wood for the engraver, more simply and efficiently than by any other plan we know.

It is possible by means of our process with collodio-chloride of silver, to obtain excellent images on ivory, but as the image in such case is in most cases entirely in the film, it would be impossible to remove the collodion without destroying the picture. Where the retention of the collodion film is not an objection, nothing could be better than the results so produced.

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PHOTOGRAPHY AT AN INDIAN AGRICULTURAL SHOW.

A few years ago the practice of photography in India used to be considered a most arduous task, and the production of soft, delicate pictures almost an impossibility. Hard, black and white prints were the rule—detail and gradation being rarely obtained without enormously long exposures. Within the last year or two, however, there has been a very great improvement in this respect, and many of the Indian pictures we see are in no point of photographic excellence inferior to the best of those produced at home. The universal introduction of bromides into collodion has doubtless done much to effect this: the rapid decomposition of iodized collodion in an Indian climate, kept the photographer in perpetual difficulties, from which the greater stability of bromo-iodized collodion, and its tendency to yield half-tones, has done much to relieve him.

We have recently received from our esteemed correspondent, Lieutenant Noverre, a series of prints from negatives taken for the Bengal Government, of the best animals shown at an agricultural exhibition held in Calcutta. The first feature which strikes us is the admirable pictorial arrangement, and the spirited and characteristic pose of the animals; and the next is the wonderful softness, detail, and texture secured. Here is a mare and foal, with attendant, which might be prized as a study of grouping for a painter: and next, a white horse that, for modelling, texture, symmetry, and life-like grace, Wouvermanns might have envied. Bulls, buffaloes, goats, sheep, &c., of native and foreign breed, are all equally well rendered; the pictures in many instances evidently being instantaneous, and are equally free from moving from under-exposure. The composition and grouping are moreover in many cases exceedingly happy. We have often been surprised that so little is done with similar exhibitions in this country; we have certainly rarely seen any pictures of similar subjects at home so perfect either in photography or art. As regards the mode of operation, we are informed that there is little modification made from the processes found successful in England. The pictures are for the most part in size about 7 inches by 5 inches. Lieutenant Noverre gives some excellent hints on securing pictures of animals. He says:—

I will give details in a few words, though there is nothing novel in the process, nor did I make much modification on what I should have used at home. They were taken as you see against a background made of matting, and owing to the short notice I had, I was unable to get a more suitable one constructed: this background was faced towards the south-east, so as to have the sun shining on the animals the best part of the day (after 2 o'clock the light begins to deteriorate out here, and I generally began work about 7 o'clock, a.m.). I had an open-fronted shed erected in front of the background, at a convenient distance from it, under which the camera stood, and also my dark tent, so as to be protected from the sun.

I used Dallmeyer's No. 2 Triple full aperture, and Meagher's Portable Stereo Camera, which is arranged to take pictures on plates 7½ × 5¼. The great difficulty I always find with animals is to get them to look lively; when they have been tied up, or have been held for a short time, they either get so restless that you can't manage them at all, or so sleepy and quiet that it is difficult to excite their attention or rouse them without moving them from the required position. I often crack a whip just as I am ready to expose, or with horses and dogs calling to them is often sufficient, to make them prick their ears and look up. I have sometimes succeeded in getting a lively expression by firing off a pistol; this should be done with one hand on the shutter of the lens ready to expose directly the animal looks up.

The shutter I used was a flap shutter, and the exposure made as quickly as the flap could be opened and shut, or when circumstances permitted, it might have been kept open for a second or two; this, of course, gives a better result, but cannot often be done, as animals generally have to be taken when some part of them is slightly on the move.

And now for the formulæ:—I used the collodion described in the News Almanac, only with rather less pyroxyline, to make it a little more limpid than I should use it in England. The proportions between iodide and bromide was 4 grains of the former and 2 grains of the latter per ounce of collodion, the solvents being methylated.

The bath contained 40 grains silver to 1 ounce water, decidedly acid with nitric acid.

The developer was as follows:—

Ammonia sulph. iron	35 grains
Glacial acetic acid	15 ,,
Water	1 ounce.

Intensified with—

Pyrogallic acid	2 grains
Citric acid	2 ,,
Water	1 ounce.

With a few drops solution of nitrate of silver 20 grains to 1 ounce water added. Fixed with cyanide of potassium, 10 grains to 1 ounce water. I sometimes found it necessary to redip the plate in the bath from its having partially dried, and I sometimes applied the developer two or three times with a few drops of silver solution, and washing after each application. I endeavoured to get the right amount of intensity before fixing; but if, as sometimes happened, that I found the negatives too thin after fixing, I strengthen them by the iodine and pyro method given in your Almanac.

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ENAMELLING THE SURFACE OF PHOTOGRAPHS.

A correspondent, signing himself "A Northerner," sends us another method of giving an enamel surface to photographs, with some pleasing examples of the effect conferred. The result is very good, and from the nature of the materials employed, it seems probable that the photograph will be entirely preserved from the injurious influence of damp, &c. The process, as described by our correspondent, is as follows:—

Coat the plate with plain collodion, and hold it to the fire until it is dry, then pour on the collodion a spirit varnish, quickly but gently, as you varnish a negative, pouring back the surplus into the bottle. Lay the plate on a wide-mouthed bottle, and let it stand a few minutes until it begins to dry round the edges. The prints have been previously immersed in methylated spirits; now lay them on the prepared plate, in the same way as that described in Mr. Tunny's process. Press all air-bells carefully out; then take a piece of blotting paper and lay it on a piece of glass the same size as the plate; take the plate and lay it on the blotting paper, card side next the paper, place a weight on the plate to keep the card in close contact with the varnish, and let it stand a few hours. Now remove the weight and take the two plates and keep them in close contact at the ends, with both hands, hold the coated plate to the fire until it is dry. Remove the glass from the back and hold the blotting paper to the fire to see if it is thoroughly dry, as if not it will be a failure. To remove the finished print from the glass, cut the varnish and paper collodion to the glass with a sharp knife, dip the plate in water as hot as the hand can bear it; and on lifting it out the card will come off the glass like the peeling of an onion.

The varnish I have used is one I made two years ago, and I can hardly give the exact proportions of gum used; but it is something like this: 38 grains gum juniper, 10 grains gum shellac (orange), 5 grains black rosin, or fiddler's rosin, as it is called here, into (a small bit of camphor makes the gums dissolve) 1 ounce of spirit of wine (methylated), shake up the bottle before using. Possibly there are better varnishes, but I believe any kind of spirit varnish will answer. A little turpentine would make the varnish I used more tacky, but I see it objected to in your pages, as it darkened through time. If this process be practised or something like it, we shall hear no more of faded photographs.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Printsellers *v.* Photographers.—Mr. Sutton's Novel.—Appropriation of Inventions, The Simpsontype.—The Image in a Dead Eye.—Residues.—In Memoriam.—The Societies.—The Rumour.

It has often been a matter of wonderment to me that print publishers have so seldom carried out the tremendous threats of prosecution to which they have occasionally given vent. The milk in the cocoa-nut is explained at last. In the case of Lloyds *v.* Ashfords, in which the copyright of the well-known lithograph entitled "Mighty Oneconvaniant" was in dispute, partly heard before Sir R. T. Kindersley, his Honour laid down the law that "if an engraver intentionally struck off a number of artist's proofs after the plate was completed, but before the name of the publisher and date were added, he would not acquire a copyright, which the Act gave to those only who put the name and date on every print." It follows, therefore, the *printsellers have no copyright in most of their works.* They have known this all along, and this was the reason of their mercy. To hold copyright the publication line must be on every print published; the greed for fancy prices for artist's proofs, or proofs before any letters, has got the better of the publishers' discretion, and they, trusting to photographers' ignorance of the statute, have "let the law go whistle," and have feared to prosecute and expose their weak point to their enemy, the photographer. If a man cuts down his fences he must not complain if his neighbour's cow nibbles his pasture. If he himself had taken good care that his own cattle had cleared the field first he would not have had to complain that his neighbour's lean kine grew fat at his expense; in other words, if printsellers had not been so obstinately blind to their own interest they might have filled the market with photographic reproductions themselves, instead of leaving it open to those they delight to call pirates. I object to piracy quite as much as I should object to highway robbery, I even go further, and object to a man taking "that which isn't his'n," simply because the owner has not quite secured his legal right to the property, but publishers must obey the law as well as photographers, or they will find it "mighty oneconvaniant!"

Mr. Sutton has introduced a new feature into photographic literature. In the first number for the year of the *Photographic Notes* commences a novel, entitled, "The Photographers," by the Editor, in which Mr. Sutton proves what I have often thought, that he is not only a forcible and humorous writer, but highly imaginative also. "The Photographers" promises to be a very well written and entertaining story.

It seldom happens that any great discovery, or small one either, is announced in photography, but somebody immediately jumps up, and says, "That's mine! I have the honour to stand before you as the original inventor," &c. &c. This is of very little consequence in the majority of cases; the honour of making imperceptible modifications in such things as camera stands, methods of vignetting and dry processes, is so minute that it must be mere amusement, and that of a very mild character, to contend for it; but when an important and original discovery is made, it is annoying to all who have any respect for honesty to see the old formula repeated, and to hear the "that's mine" hollo'd out from some unsuspected place, and in a totally unknown voice. At the risk of having my manuscript scored by the Editor, but from which I ask him to refrain, I will state a recent case. It is well known to the readers of the News, that its Editor has discovered a very valuable method of printing by means of chloride of silver suspended in collodion; the method was, undoubtedly, suggested to him by his experiments in Wothlytype, and is allied to that process in character. This was announced, in a very modest and unpretending way, in a leader, in the News, some time in October last year. Since that time, many photographers, including those experienced and acute observers, Mr. H. Cooper, jun., and the "Photographer's Assistant," have made experiments on the process, and have expressed their unqualified admiration. The process promising to be a great success, is, of course, considered fair game, and a thing to be pounced upon, by those who have, or fancy they have, experimented with something similar, and from having been silent on the subject, it is possible have failed. A Mr. Mori writes, that he discovered the process long ago, long before the Wothlytype, which suggested the process, was heard of! * and that he kept it secret until his employers, who are, it seems, makers of photographic chemicals, were prepared to sell the materials, notwithstanding that they, it appears, were not aware there was any novelty in such a mode of using chloride of silver!

That Cock-Lane ghost of photography, the image in a dead eye, is surely laid at last. It is astonishing how error will creep round the world when it gets a good start. The Florence correspondent of the *Morning Post* has betrayed its Editor into a leading article, which placed great faith in the story; but, a few days afterwards, the *Daily Telegraph* correspondent, at the same Italian city, completely set the matter at rest, by giving the important information that the image which was taken for the supposed murderer was on *the cornea of the eye.* The most elementary knowledge of anatomy is sufficient to explain that *that* is not the place to look for impressions of objects; as well expect to find a negative on the lens of the camera.

Something has been said about recovering silver from residues during the month; a subject almost as important to professional photographers as obtaining sitters. There is an impression abroad that to save a large proportion of the silver used in the various photographic operations would involve the employment of much time and trouble. This is a mistake. The chief thing necessary is system, a quality in which I fear some photographers are deficient. I am acquainted with an establishment in which 75 per cent. of the silver used is recovered, and that without any apparent effort.

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* The first suggestion of this process arose to our mind, when attending the meetings of the British Association in Bath, after a conversation with Professor Roscoe on his method af actinometry. We then discussed with him the difficulties of a plan in which paper excited in the ordinary way was employed to measure the action of light. It occurred to us that if chloride of silver could be employed, for actinometry, in an inert medium, that a great advantage would be gained; and immediately on our return to London, being invited by Col. Stuart Wortley to witness the Wothlytype manipulations, the use of collodion with chloride of silver occurred to us as a possibility, and the next day was put in practice as a fact.—Ed.

The method is this:—Two wooden tanks, 2 feet 6 inches square, and 3 feet deep are placed in the yard. Into one of these receptables all the washings of prints before toning, old baths, and every solution containing silver that might be reduced in the state of chloride are thrown. Into the other tank is poured the used-up hypo and other solutions which could not be reduced as chlorides. When the tanks become full the salts are reduced, the contents of the one tank as chloride of silver, with common salt or hydrochloric acid, and the other as sulphide of silver, with sulphide of potassium, known also as liver of sulphur. After being allowed a day to settle, the supernatant fluid is allowed to run off into a drain through a tap placed low down in the tank. There will be, as Friar Laurence says, "much salt water thrown away in waste." They are then allowed to fill again, and the accumulation of solution is again reduced until it is thought advisable to collect the residues and send them to the refiners. It is found that the hyposulphite solutions yield a large proportion of silver. The cutting of the prints are also collected and burnt, the ashes are then sent to the refiners. The prints should be cut as close as is prudent *before* they are toned. The cuttings of finished prints are not worth saving. The drawback to the above method of saving the silver contained in the hypo solutions is the abominable smell. Mr. Hart's ingenious apparatus for saving residues from old hypo and other solutions by electricity promises to save photographers and their neighbours from this disagreeable nuisance.

All photographers must be deeply grieved to hear of the sad death of Lyndon Smith. All must remember the magnificent works be exhibited at some of the earlier exhibitions of the Photographic Society; works, grand in conception and perfect in execution, and altogether removed from the beaten path of photographic landscape. While regretting his death it is some consolation to know that he died like a brave man, nobly endeavouring to save the lives of others. He took the first medal awarded by the Photographic Society of Scotland, and made many valuable contributions to photographic literature. He also claimed the independent discovery of toning with alkaline chloride of gold. Mr. Smith was, perhaps, our most original landscape photographer. In the same month we have lost one of our best figure photographers; the Viscountess Hawarden, whose pictures attracted much attention at the two last exhibitions of the London Society, for their originality and genuine art qualities, and which obtained medals at each, has also departed from amongst us.

At the Parent Society (and what an unnatural old parent a contemporary would persuade us she is) Mr. Haes read an interesting paper on his photographic experiences amongst the wild beasts in the zoological gardens, illustrated, by aid of Mr. Highley and the magic lantern, with the results obtained. The sad death of a photographer and his son at Manchester, occasioned a long discussion on different methods of manufacturing oxygen gas, in which Mr. Highley, Mr. Mayall, and Mr. Sebastian Davis took part. Mr. How exhibited a safety retort. Mr. Johnson exhibited his pantascopic camera, and explained the method of working with it. He also exhibited some of the most beautiful panoramic pictures pictures taken with it that it is possible to conceive, although it is true that several members could see little beauty in them, because the perspective was not—I won't say untrue—but what they had not been accustomed to see in a photograph taken with a lens including a small angle. Panoramic perspective is *not* plain perspective, which sounds like a truism; but the pictures are very beautiful, for which I, for one, am grateful. Mr. Peter le Neve Foster suggested that a discussion on the important mathematical principles involved in this question would be an interesting subject for the next meeting. It might be interesting to a few, but it would certainly provide the uninitiated who tried to follow the speakers with a headache. At the South London, Mr. Sebastian Davis read a paper "On Lines in the Direction of the Dip and their Avoidance." These aggravating lines are a nuisance that every photographer gives a different reason for, but Mr. Davis showed that they could be avoided by moving the plate the moment the plate was put in the bath. Mr. Johnson favoured this meeting also with a sight of his panoramic camera and pictures. Mr. Rowsell brought an instrument which he calls a "Graphioscope" to bear on photographs. Mr. Warner exhibited and explained his camera stand, upon which Mr. Hughes made some very pertinent remarks. At the meeting of the North London Society Mr. Hislop exhibited and read a paper on the most simple and ingenious camera stand I have seen. His paper, with an illustration has appeared in the News; I need not, therefore, further describe it. Mr. Highley attended with his magic lantern. It is a pity this exhibition was not advertised; we might have had a "grand juvenile night," and members could have brought their children, the latter would have been quite as able to appreciate most of the pictures shown as the members of a scientific body.

At the principal provincial meeting, that of the Photographic Society of Scotland, Mr. Pouncy read a paper on Carbon Printing. He commenced, as is his wont, by claiming the origin of photographic carbon printing, which I, in common with all who know the history of photography, beg leave to doubt. The paper was long, but contained no details of the process. He concluded by saying, "But, Sir, if by one pair of hands and this shallow pate of mine, this process has thus far prevailed, who shall predict the limits or extent of its application when it shall have received the same amount of attention and talent that has hitherto been given to silver printing!" Who, indeed! but how is the process to receive any attention if he persists in keeping the formulæ secret? It is not by antagonism to others that great men have become famous. What a pity it is that Mr. Pouncy, having a real claim to so much, arouses the opposition of photographers by claiming more than he can substantiate! and how much more a pity that he does not, having secured his process by patent, with open-hearted freedom communicate full details of his process to photographers, and so place himself in a position to secure the co-operation of the general photographic public! He may rest assured that his process will not attain the perfection of which it is capable without such co-operation.

In discussing Johnson's camera at the Literary and Philosophical Society of Manchester, the chairman alluded to the curious circumstance that there never appeared to be anything new. An invention could not appear, but some one had invented it before, which entirely coincides with my remarks on the Simpsontype.

The Sheffield Society discussed washing apparatus! They have given up their contemplated *soirée* for the present.

The Edinburgh Photographic Society discusssd the merits of Messrs. Helsby's "Helioaristotypia." The chairman observed that Messrs. Helsby had introduced an old friend *in a new case*. All the members present condemned the name as absurd.

Mr. Douglas Hardie favoured the Glasgow Photographic Association with "Some Remarks on the Construction of Glass Houses." As I shall have something to say myself on this subject next month, I postpone any further remarks on Mr. Hardie's paper.

Some fifty or sixty years ago, when I was quite young, children played at a game, the only part of which I remember is this couplet,—

> "Did *you* ever know anything half so absurd?
> *I* know of a rumour that nobody's heard."

The fun of the game was, as far as I can recollect, how a rumour could be a rumour if nobody had heard it? I am obliged to one of the contemporaries of the News for clearing away the mists of half a century, and recalling the days of my childhood. The paper, to which I refer, announced with much circumstance, that a rumour had been industriously circulated "to the effect that the *Journal of the Photographic Society* (owing to inefficiency in its management) having become utterly unworthy of support, the Council had decided to merge it into one of our contemporaries, which hereafter was to be the organ of the Society, *vice* its own journal deceased." I have "industriously circulated" myself among photographers since this singular announcement appeared, but have not succeeded in meeting with one who had heard the supposed rumour. In fact, "photographic circles" were in a position to play at the little game I have mentioned. Perhaps, as the Editor of the journal which found out this mare's nest is, as Mrs. Malaprop says, like Cerberus, "three gentlemen at once," it really was a rumour after all. They might have mentioned it to one another!

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ANOTHER PERMANENT PRINTING PROCESS.

We have received from Mr. Deltenre Walker, of Brussels, some specimens of another printing process for which a claim of permanency is made. They are produced, it is said, by means of a salt of iron, and gold or platinum, but in a manner different to any hitherto published, the invention being due to M. Esselens, described as a distinguished chemist. The process is probably based upon the Chrysotype process of Sir John Herschell, in which a persalt of iron is changed into a protosalt by the action of light, and thus acquires a power to reduce gold, platinum, &c.

The prints we have received are described as the imperfect results of a first trial, and are not to be criticised as pictures, and they are, moreover, reproductions, which are not the most favourable for affording a fair estimate of a process: we will not, therefore, at present enter into further discussion of their pictorial qualities than to state that they are vigorous and clean, with pure whites, and shadows varying in colour; one is a bluish green, another of a lavender tint, and a third of a rich purple. It is probable that the process will be patented in this country, and we shall then probably if not before, hear something more of it. In the mean time we append the statement of claims made for the process.

1st. The permanency of the image, which is composed of pure gold or of gold and platinum.

2nd. Economy, by the omission of the salts of silver replaced by gold in a minute quantity, the expense being reduced by more than three-fourths; ordinary paper and common water are also employed.

3rd. Economy in time. A washing of a minute or more replaces the toning, fixing, and the six or eight hours of washing necessary in ordinary printing.

4th. Colours that by ordinary photography cannot be imitated; and the applicability to a great number of purposes not at present readily available in photography.

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CONCERNING BACKGROUNDS.

BY JOHN T. CUSSANS.

In turning over the leaves of a photographic album, our sense of propriety and good taste is not happily so much outraged as formerly by the startling backgrounds, and heterogeneous collection of properties gathered around the sitter as accessories; yet still there is great room for improvement in this respect. Only last week a gentleman showed me a portrait of himself, which represented him in the costume of a sportsman stepping over a stile. A garden scene did duty for a background, in the centre of which was a fountain of two jets, which were so artfully contrived that they furnished the gentleman with a magnificent pair of horns, in the manner represented by Hogarth in his picture of the henpecked husband with his family at Sadler's Wells. The only field of cloth, of which I remember to have heard, was that in which Henry VIII. and Francis met and enjoyed themselves; but in the photograph which was submitted for my inspection, I discovered that the stile separated two fields of oil-cloth. These absurdities did not seem to present themselves as such to the gentleman; for he expressed himself highly satisfied with the production, and called my especial attention to one foot which was raised, exhibiting all the nails in his boots, which he seemed to consider a marvel of photographic art. He was a member of a skating club, he informed me, and wished to be taken with a winter scene, and something white on the ground to represent ice. Can anything be imagined more graceful and natural than a skater doing the "outside edge" *with a head rest?*

Now whose fault is it, that such abominations, conceived and executed with such a reckless disregard to the eternal fitness of things, are produced? Are the public, or their pictorial biographers, to blame? Photographers—or at least those who are guilty of the atrocities to which I allude—will answer, "The public demand and pay for them, and it is no business of ours whether they are in good or bad taste. Pardon me, it *is* your business. It would be idle to suppose that a photographer could—but by the veriest accident—produce in two minutes as artistic a picture as Sir Joshua or Sir Thomas would possibly have consumed weeks in arranging: but he can at least avoid such glaring inconsistencies as I have pointed out. It is an old proverb, that "if there were no receivers, there would be no thieves:" the converse of this proposition is equally true: so, if there were no photographers willing to gratify the depraved taste of certain sitters, it is very evident that the astounding absurdities which we occasionally light upon could never be perpetrated.

Simple figured or diapered backgrounds are also to be deprecated, though, perhaps, in a milder degree. There is certainly one advantage which they possess in common with scenic backgrounds, over plain ones; and that is, that they frequently conceal a multitude of streaks and stains in the negative. Beyond this I can think of none other: but I could enumerate a dozen *dis*advantages arising therefrom. The principal is, that should the sitter's face be turned at all in profile, and ever so small a piece of the pattern behind show on the nose, for instance, the whole character of the face is changed, and the sitter's friends without, perhaps, being able to discover what is the fault, unanimously concur in the verdict, that it is not a likeness.

If, however, the photographer be resolved to have a figured or diapered background, the least objectionable is flock paper painted in flatted oil the requisite tint. It will be found much easier to paint it at once in flatted oil, than to flat it afterwards, as streaks or "cut shades" are very apt to be caused on account of the rapid evaporation of the turps. For plain backgrounds, I am convinced there is nothing as good as distemper, and I believe I have tried nearly everything. In the first place, it is a very difficult matter to get an oil background perfectly smooth and dead, not to mention the expense; for there are very few photographers who are sufficiently adept in the art of painting to do it themselves. Should it become soiled, it can be washed, certainly, which, of course, distemper cannot; but ten to one, before it requires it, it will be so scratched and marked as to require repainting. Some time ago, I bought a piece of extra wide cloth, made expressly for backgrounds; but, after it was stretched, the seams caused by folding were painfully apparent, and no amount of sponging and ironing would remove them. It is now degraded to the position of table cover in the dressing-room. Then I tried a sort of French felt, which the traveller who exhibited the sample declared was *magnifique.* This was to be wrapped on a long roller, so that there should be no folds: but here again I was doomed to disappointment; for I found, on opening it, that it was completely traversed with well-defined and indelible ridges caused by the roller. If, for no other reason, distemper should reign paramount on account of its economy and cheapness. There is a vast amount of difference in the meaning of these two words.

For the sake of those who are anxious to distemper their own backgrounds for sixpence, as I stated in a former paper, every photographer ought to be able to do, I will briefly detail the *modus operandi.* If the canvas be quite new, and have never been painted on, it will be necessary to give it one or two coats of size or thin glue; it is better, however, to prime it with a coat of paint. Then prepare the colour. The easiest to use is amber alone. This gives a full, dark, photographic tint, which can be lightened to any degree by the admixture of whiting. Mix one pound of amber, which costs twopence, with about half a pint of water; stir it well, then add about three quarters of a pound of hot size (three farthings) and another half pint of water. A piece of whiting in addition to this, about the size of an egg, will render this a very good tone for a general winter use; backgrounds, in summer, can always be a trifle darker. Strain through three or four thicknesses of canvas, so as to filter out the scum of the size and lumps of colour. This quantity will be sufficient for a background eight feet square, supposing it to have been previously painted with distemper. On no account must it be used until quite cold, when it ought to be of the consistence of thin jelly. It is better to use too much than too little size, for if the colour be too thick when cold, it can be diluted with water. A two- or three-tie brush is the best wherewith to apply it. Vegetable or drop black and whiting, with a suspicion of venetian red, give a very agreeable tone, but is difficult to manage, as the black is so light that it does not readily amalgamate with the other colours. As it is almost impossible to mix it with water, it must be put into a basin with a little hot size, and beat into a paste; then add the water and other colours. Some painters use milk or porter in the place of water, but I have not been able to discover any difference in the results. A flatted background must never be covered with distemper, for it will most certainly cause it to crack, leaving irregularly-shaped concave patches varying from one to six or eight inches; and subsequent coats will rather increase than lessen the evil. Should the photographer wish to distemper a flatted surface, he must previously paint it with ordinary oil colour, which is elastic and admits of the contraction caused by the distemper. A new background is much improved by rubbing it with pumice stone after the first coat of colour is dry, so as to wear down the knots and other roughnesses in the canvas. If the same colour be always employed, five or six coats may be laid on successively; but it is difficult to apply a light colour over a darker, as the latter is apt to "ruck up." In such a case, it is safer to wash off the old colour with warm water, or, as this is a dirty job, cover it with oil colour. The inexperienced painter should not attempt to use distemper when there is much moisture in the atmosphere, for, unless the painted surface dries quickly, the colour is likely to run down in irregular streaks: this annoyance, however, will not occur if the colour be properly mixed up and skilfully applied. It is always well to prepare double the quantity of colour required, in case the first coat should not dry perfectly solid.

One important fact must be borne in mind; and that is, that distemper always lightens considerably when dry. Supposing the range of colours from white to black to be represented by twelve, the difference between the same colour wet and dry would be about two. In cases of urgent necessity a distempered background can be speedily dried by passing a hot fire shovel before it, in the manner recommended by M. Soyer for braizing omelettes. Care, however, should be taken not to hold it too long over one spot, or it will cause the water and colour to separate; the former running down in tears; besides making the under-coating of oil-colour blister.

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ON LIGHTING AND POSE IN PHOTOGRAPHIC PORTRAITURE.

BY MM. PETSCH AND H. VOGEL.*

THUS far we have considered the difficulties which present themselves in successful portraiture from a public point of view only; it would not be just to pass by in silence defects for which the operator is wholly responsible, and these defects are numerous; we shall limit ourselves, however, to a few of them.

The most common defect of all, perhaps, is the wearisome monotony that prevails in all *cartes de visite;* that constant repetition of the same attitude, the same accessories, drapery, and even lighting.

Let us suppose that a photographer has obtained a charming portrait, perfectly successful, and quite worthy of the reputation he has acquired for taking a lady's portrait. It represents her seated at a table, her head resting on her hand; it will be a thousand chances to one that this photographer will go on reproducing the same arrangement for every young lady who sits to him for her portrait for several months in succession. Nor will he ever once reflect that this *pose,* natural and graceful for the first sitter, will give a stiff and awkward air to any other person not accustomed to take such an attitude. He will neglect to take care that the background, and draperies which perfectly harmonize with the colour of the clothes in the one, do not jar, on the contrary, with the costume and *tournure* of the other; nor take into account that the light which flatters the one in so agreeable a manner, and perhaps by the mere result of accident, will completely falsify the likeness of another.

Others make all ladies *pose* standing, with one hand concealed in the folds of their dress, or holding a book, or handkerchief, or with the finger on the lips, like the Goddess of Silence, and they continually reproduce the same arrangement with all sitters, until some fine day they are surprised with a new brilliant idea, which they adopt and stereotype to infinity.

It is still worse when certain attitudes are adopted which are quite unsuited to the person represented; thus, a woman may be placed beside a column, in a very picturesque attitude, which will shock no conventionality, if the woman thus represented is some tragedy or opera heroine; but a little chambermaid would look very ridiculous in such a *pose.*

Another defect, not less frequent than monotony of *pose* and accessories, is bad lighting. This is the very gravest fault committed by operators. A great many among them, very skilful in other respects, have not the slightest conception of chiaroscuro. In the early days of the photographic art it was necessary to have recourse to as strong and intense a light as possible, with a very long exposure, to obtain any kind of picture. Time brought many ameliorations in this state of things; more sensitive agents were employed, and more powerful objectives; the time of sitting was reduced, and it even became possible to operate in cloudy weather: yet the advantages of diffused light, skilfully managed, are still a dead letter for the majority of photographers. The direct light of the sun is generally avoided, but the operating-room is left open to light all round. The consequences of this negligence are found indelibly stamped on thousands of portraits. Sometimes the light is allowed to fall from above, strongly illuminating the hair and forehead, and throwing the eyes, nose, and lips into deep shadow. The hair thus lighted appears grey instead of brown or black, the hands and forehead are of a flat white, as light as the linen, while, in reality, the reverse is the case. The eyes are deeply buried in their orbits, overshadowed by the brows; the nose, lips, and under chin appear like dark spots, and hard, harsh shadows disfigure the face, presenting a disagreeable contrast with the dazzling whiteness of the lighted parts. Whatever may be the lineal resemblance of such a portrait, it is not surprising that the public regards it with horror.

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* Continued from vol. viii, p. 592.

No less frequent is the defect caused by operators placing their sitters opposite a strong light; they do not perceive that it causes the eyelids to become half closed, and that the eyes thus acquire an aspect devoid of expression, life, and motion. Other photographers, who very well understand the importance of diffused light, take care to furnish their operating-rooms with screens and curtains; unfortunately they do not take sufficient pains to study their use or to make experiments with them. They inevitably fall into that monotony with which we reproach so many of their fellow operators; their pictures are all lighted in the same manner; they never seem to suspect that the rugged and strongly-marked features of an old man require an entirely different lighting to that which best suits the delicate and *mignon* features of a young girl, or that blue eyes require a different lighting from those that are brown They do not appreciate the different effects produced by the distribution of light under varying conditions; they do not comprehend that therein consists the giving of relief and solidity to the planes of the features, or softness to faces cut by hard and strongly-marked lines.

Arrangement is a no less abundant source of errors, faults, and inaptitudes. How many portraits we see, excellent in other respects, encumbered by furniture, statues, books, *secretaires*, vases, and all sorts of instruments, amid which the principal object, the portrait itself, disappears, becoming secondary or quite lost; the light tones of these accessories rendering this defect still more displeasing. Very frequently, the choice of the background engenders these errors; it is usually made too light, not to mention such as are overloaded with pictorial accessories in very bad taste. The "properties" of a small theatre are continually thrusting themselves before our eyes; now it is the stereotyped garden, with its stone balustrade and vase, and distant grove and hills; or it is the heavy curtain, with its stiff folds, or crumpled up like a pocket-handkerchief, or drooping like a wet sheet, and quite at variance with background, furniture, or other accessories: and yet, no one can be ignorant of how much a drapery, elegantly and tastefully arranged, contributes to the good effect of a portrait.

We have sketched only a small portion of the defects that most frequently occur, and shall have occasion to refer to them again. Let us remark in this place, that it is not always easy to avoid them. The first condition of success is the possession of *artistic* feeling on the part of the operator, in the selection of the lighting of the model, together with the most favourable *pose* and lighting; and, on the other hand, to study to seize quickly and surely the arrangement that best suits this or that sitter, and to judge beforehand the effect he will obtain, so that he may not find it out when too late, that is to say, when the portrait is printed.

This aptitude may be acquired by long practice, reflection, labour, and, especially, by observation. As to the feeling of the beautiful in art, it is a natural gift which no education can supply. He who has not been endowed by nature with this sixth sense will never be anything but a mechanical workman, who must never attempt the aspirations of art. How is it, it may be asked, that so many productions, bearing no trace of art, find currency? Alas! it must be confessed that the great majority of purchasers are as deficient in the feeling for the beautiful as the operators who so mercilessly disfigure them!

We are very far from casting all the responsibility of the evil upon the shoulders of photographers. Men, for the most part, do their best; and if it be only mediocrity, it is not always their fault, but rather that of the education they have received.

In most operating rooms, as in the majority of manuals, only the purely mechanical part of the photographic art is taught; mere empirical processes: nowhere can the operator find an opportunity of acquiring the knowledge of the principles of chemistry indispensable to his profession; nor of informing himself of the no less indispensable exigencies of art and of the beautiful.

Science treats art like a stepmother, and artists themselves rival the *savants* in their indifference. In this matter the State has a right to interfere, to prevent photography from contributing to the degradation of art; and perhaps the time is not far distant when we shall see photographic academies arise, where artists can receive at the same time a technical, esthetic, and ecstatic instruction, such as painters and sculptors receive at our academies for the fine arts.

(*To be continued.*)

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ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

The Mezzo-tinto is a method of engraving, the discovery of which is attributed to Prince Rupert, and it may not be uninteresting to quote the following letter by Dr. Diamond, which was communicated by him to the Society of Antiquaries in 1838, and to which is appended a catalogue of the earliest known works in mezzo-tinto. The catalogue will be found in vol. xxvii. pages 405 to 409, of the Archæologia.

To Sir Henry Ellis, K.H., F.R.S., Secretary of the Society of Antiquaries.

"Dear Sir,—In the last session I had the honour of laying before the Society of Antiquaries, several remarkable specimens of early mezzo-tinto engraving, which prove beyond doubt that the generally received opinion as to Prince Rupert being the inventor of that style of engraving is erroneous. From the examples then exhibited, it appears that the person to whom the merit of the invention is due, is Louis von Siegen (or *L. à* Siegen), a lieutenant-colonel in the service of the Landgrave of Hesse Cassel. The works of this amateur artist are of considerable rarity; and it is not improbable that they were merely distributed among his friends and patrons. Baron Heineken, in his 'Idée Générale d'une Collection complette d'Estampes,' printed at Leipsic, in 1771, says decidedly that Siegen was the inventor of mezzo-tinto engraving, and observes that the first specimen which appeared was the portrait of the Princess Amelia, Landgravine of Hesse; he adds, that Prince Rupert learnt the art from Siegen, and that eventually it became public. In the new edition of 'Granger's Biographical History of England' we find some observations on the invention of this style of engraving.—'It should not be forgotten that Sir Christopher Wren is said to have been the inventor of mezzotinto; it is certain there is a Blackamoor's head by him in a different manner to that of Prince Rupert; also, Vertue, in a manuscript in my possession, mentions a large head *something like mezzotint*, of the Princess Amelia of Hesse, thus inscribed: 'ad vivum a se primùm depictam, novoque jam sculpturæ modo expressam, dicat consecratque L. à S. anno 1643.' Mr. Wanley says there is one of this lady in Lord Harley's collection of heads, also one of the Comes of Hesse, by the same hand, who was the person who taught Prince Rupert.' Mr. Lodge, in his life of that prince, contained in his 'Portraits of Illustrious Persons,' after mentioning the prince's contributions to science, and various discoveries, says, 'But the discovery which we find most frequently associated with his name, is of the art of engraving in mezzotinto, the first hint of which is said to have occurred to him from observing the effect accidentally produced by a soldier scraping some rust off the barrel of his musquet; his right, however, to the strict reputation of inventor has been somewhat questioned, *but with little probability*.'

"It will be seen by this that Heineken's authority is doubted; but Mr. Strutt, in his 'Biographical Dictionary of Engravers,' although more cautious, is nevertheless in doubt on the subject; for he says, after noticing the story of Prince Rupert's observing the soldier scrape the rust from his musquet:—'If the account, as given by Baron Heineken, be allowed as authentic, and it bears every appearance of being true, especially *if such a portrait really exists*, then the probability of the first story is entirely destroyed. I must leave the reader, however, to decide, having given him all thy information I could obtain on the subject.'

"Now from the extracts given, it is evident that neither Strutt, Bryan, Granger, nor Noble have ever seen the engravings in question; and it is a remarkable fact, that not one of them is to be found in the fine collection of the British Museum. The example I have now the pleasure of exhibiting, is a portrait of the eldest daughter of Charles the First, inscribed: 'Augusta Maria Caroli: M: B: Reg: Filia. Princ: Aur. Sponsa,' and is of great rarity; one other only being known in England, namely, that in the collection of Mrs. Sutherland; which is, however, I am informed, very much injured.

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* Continued from page 44.

"The present portrait, as a work of art, is curious from its combining two distinct styles of engraving; the figure being entirely mezzotinto, and the background in line and 'cross-hatched.' The likeness is highly interesting from the strong resemblance which it bears to the Stuart family, especially to Charles the Second, and his brother, Frederick Duke of Glocester. Near the base of the picture in the right-hand corner are the words, 'Honthorst pinxit, L. à Siegen inv. [enit] et fecit;' and it is worthy of observation, that the word *Inventor* is generally found on the works of Siegen. On the Holy Family, engraved by him after Caracci, and dedicated to Cardinal Mazarin, is the follow-remarkable inscription:—'Eminentissimo Domino D. Julio Mazarini S. R. E. Cardinali, &c. Novi hujus Sculpturæ modi *primus inventor* Ludovicus a Siegen humilissime offert, dicat et consecrat, A^{o}. 1657:

"Huber, the compiler of Winckler's Catalogue, tells us that Theodore Caspar de Fürstenbergh, a Capitulary Canon of Mayence, was an engraver in mezzo-tinto; that his works are contemporary with those of Siegen, and expresses a doubt as to which was the disciple of the other; adding, if Fürstenbergh learnt the art of Siegen, he excelled his master. But there is no evidence whatever to warrant this doubt; on the contrary, the portrait of the Queen of Bohemia, which I exhibited in February last, bears the date of 1643, while the earliest known specimen of Fürstenbergh is dated 1656. It is only necessary to add that Rupert's earliest effort in mezzo-tinto (though etchings of this Prince are earlier, and one is known incribed as Rup. Pr. 1637) is of the year 1658. In conclusion, I subjoin a catalogue of the known works in mezzotinto of Siegen, Fürstenbergh, and Rupert, as the same has not to my knowledge ever been printed.—I have the honour to remain, Sir Henry, your obedient and humble servant,

"Hugh W. Diamond."

Louis von Siegen (or L. a Siegnen), born 1820.

No. 1. The Virgin holding the infant Jesus. In front, on the right of her, is St. John; and behind, St. Joseph holding a book in one hand and a pair of spectacles in the other, after Caracci; with the inscription, "Eminentissimo Principi Domino D. Julio Mazarini S. R. E. Cardinali, etc. Novi hujus Sculpturæ modi *primus* inventor Ludovicus a Siegen humilissime offert, dicat et consecrat." A^{o}. 1667. (Height $13\frac{1}{4}$ inches, width $10\frac{7}{8}$, without the inscription.)

2. Portrait of the Landgravine of Hesse with this inscription, "Amelia Elizabetha, D. G. Hassiæ Landgravia, etc. Comitissa Hanoviæ Muntzenb. Illustrissimo ac Cel^{ssimo} Pr. & D'no Wilhelmo VI. D. G. Hassiæ Landgr. etc. hanc Serenissimæ Matris et Incomparabilis Heroinæ effigiem ad vivum à se primùm depictam novoq' jam Sculpturæ modo expressam, dedicat consecratq' L. à S. A'o D'nj. cIↄ. Iↄ.CXLIII. (Height 17 inches, widith $12\frac{1}{8}$.)

⁂ This is the portrait spoken of by the Baron Heineken.

I am also enabled, through the kindness of Dr. Diamond, to append the copy of a letter addressed by L. de Siegen to his Highness the Landgrave of Hesse-Cassel, and which I believe has never before been printed in this country, and appears to substantiate his claim to be recognized as the inventor of the mezzo-tinto art.

"To His Highness the Landgrave of Hesse-Cassel.

"Serene and high-born Prince—Most gracious Lord,—In the same manner as my humble devotion, more than a consideration of reward, has brought me to your grace's service; though these services, however agreed by your grace, have been rather derogated by some persons, yet I have not relented in devoting to your grace my diligence, my labour, and my time, in proof of which I most humbly do present the present print to your princely grace.

"This is the copper print, most gracious Prince and Lord, which some time ago I mentioned to you to have executed to your grace's mother's laudable commemoration, with a view to bring the said portrait into the possession of several persons of rank, acquainted with the illustrious deeds of this far-famed Princess.

"But having invented quite a new and hitherto an unknown proceeding, I have been enabled to print from the copper, not thousands (as from common plates), but only a few, owing to the subtlety of the workmanship, for which reason I have only a small number of copies to present.

"Of course, I first of all make application to your princely grace, especially in dedicating the same to you, according to the inscription at the bottom, and for the following reasons:—

"The first, in remembrance of your mother, because the said object cannot be but most agreeable to your grace, as being the nearest, nay, the only son of the reigning Prince.

"For the second, because I dare not omit dedicating a work of art so rare and never heard of before, to such an extraordinary amateur of the fine arts as your grace is.

"No engraver or no artist will be able to imagine how this work could be done, because, as your grace is aware of, hitherto only three different species of workmanship are seen, namely,—

"First, line engraving, or cutting;

"Secondly, etching;

"Thirdly, a very uncommon manner, called the dotting manner, with points altogether, but different and very troublesome, and, therefore, not much in use.

"The present manner, however, is none of those, though also consisting of little dots without a single line, and though some parts have the appearance of lines, the whole is altogether stippled.

"I ought not to omit to state this for the guidance of such an experienced connoisseur as your grace is.

"Recommending your grace to the Divine Providence and welfare, I also recommend myself, remaining your grace's most true and humble servant, L. de Siegen.

"*Amsterdam*, *29th August*, 1642."

The mezzo-tinto is a process altogether distinct from those previously mentioned, and was effected in the first place by puncturing or breaking up a uniform burr over the entire face of a copper plate, from which, if a print were taken, an impression in density of colour would be obtained equal to that required in the darkest parts of the picture to be copied. Upon this ground the subject to be engraved was traced, and by scraping and burnishing away the burr or dotted surface impressed in the surface of the plate, either in part or wholly, the necessary gradations of light and shadow were obtained. This process, although affording facilities for covering large surfaces, did not admit of being applied on a small scale, so as to give detail of drawing or delicacy of outline, and was in the main inapplicable to the production of foliage, and when first practised was grey in colour and flat in effect. At a later period, with the view of facilitating the operations of the engraver, an instrument called a roulet was invented, and was used for the purpose of impressing a series of dots into the metal.

The first person who applied the mezzo-tinto process on steel was Mr. T. Lupton, who, in 1822, submitted a specimen of his work to the Society of Arts, and stated that in order to obtain the necessary ground on the steel plate he had been obliged to lay his ways in 80 or 90 directions, whereas in preparing or breaking up the surface of a copper plate from 24 to 40 ways were all that were required. The use of steel necessitated a much stronger hand and an increased number of ways in laying the ground, but the advantage of steel over copper was that from eight to ten times the number of prints could be taken.

(To be continued.)

Correspondence.

COPYRIGHT IN ENGRAVINGS, *versus* "PIRACY."

Sir,—Your correspondent J. S. W., in his able communication of last week, thinks my criticisms on the above subject are "severe," and "not altogether just." I wished them to be severe; because the practices charged against print-publishers, if true, deserve severe reprobation. If the charges be *not* true, they will fall to the ground of themselves.

J. S. W., writing with an evidently intimate and practical knowledge of the print trade, cannot prevent his statement from supporting my views in the main; and I thank him for his impartial support. Those points upon which he is opposed to me, are here further elucidated.

I pass by his interesting history of the early practice of engravers and publishers, because, being antecedent to existing copyrights, they do not affect the question which alone is under discussion, viz., *whether copyright can exist, independent of the issue of any unlettered impressions.* And that determines in itself the question of piracy; for, as is affirmed by an eminent Queen's Counsel, "where there is no copyright there can be no piracy."

J. S. W. lucidly points out that the term "artist's proofs" is at present a misnomer, because it was intended and used at first only to indicate working or engraver's proofs, whereas now it is applied to the first and finest *perfect* copies, sold at enhanced prices. He goes on to say, that the Printsellers' Association sanction such proceedings by affixing their stamp to such unlettered or "artist's" proofs; and in my last letter I mentioned that twenty-nine, so stamped and unlettered, were sold recently at public auction.

J. S. W. asserts that a certain number of proofs (*i.e.* perfect copies) were given to the engraver, *but not for sale;* I think he will find that engravers claim a perfect right to do so if they choose. But, apart from that, the fact of an engraver's right to certain copies, along with a money reward, for his labour, constitutes a sale or publication. To the public, a publisher gives proofs for money; to the engraver, proofs for money's worth—or, so much in cash, so much in goods. The process goes on in these proofs being negotiated for money or money's worth by engravers; they get into the market, their value is fixed by the presence of the engraver's autograph, in many cases they are rebought by the original publishers for resale; and hence they stand in the same category as prints issued direct from the publisher to the public. The case is parallel to that of a company, who pay their bills in part cash and part shares: shares and artist's proofs being alike marketable. Professional pride, combined with the absence of personal need, often dissuades an artist-engraver from selling his copies; but the right to do so has been stoutly affirmed. We constantly find announcements of the sale of rare collections, among which valuable engraver's proofs are specially noted; and if an artist's effects were sold by executors or under bankruptcy, there can be no doubt his proofs would be considered as saleable property. I think it is therefore justly claimable, that the issue of unlettered engraver's proofs, which legitimately find the same destination as others, is a publication within the meaning of the Act, and subject to its provisions. If it were *not* deemed so, by publishers themselves, why their recent precaution to issue no proofs at all, engraver's or otherwise, without the publication line?

J. S. W. mentions another ground of defence by print-publishers—such a contortion of plain words that I am not surprised at his confining the responsibility of its use to the utterers. He says, "they claim to have fulfilled the Act by lettering 'prints' only, and not 'proofs,' because the Act only mentions 'prints.'"

The present division into classes, of impressions from one and the same plate, is a simple trade regulation, adopted by dealers for their own convenience; and unlettered impressions can no more be foisted into the meaning of the Act than if they claimed that the word "prints" included "statues." But let the Act speak for itself:—

"Every person who shall invent and design, engrave, etch, or work, in mezzotinto or chiaro-oscuro, * * * * any historical or other *print* or *prints* (1), shall have the sole right and liberty of *printing* and *reprinting* (2) the same, to commence from the day of the first publishing thereof, which shall be duly engraved, with the name of the proprietor, on each plate, and *printed* on every such *print* or *prints* (3)."

Here the italicised words mean—1, the design portrayed; 2, the process of elucidating it; 3, the design on paper, instead of the negative (so to say) from which it was produced. The whole of the Act is similarly worded.

But what do those ugly words, "every" and "such" mean, in the same sentence? In their context of "every such *print* or *prints*," they refer to that of which designation had already been given—viz., the DESIGN, called "any historical or other print." Here we have every possible form of production included: the word "print" means any and every thing (except the ink) which forms part of an engraved picture. All are protected, if lettered; but lettered they must be; and the design is no exception. But publishers contend that they may issue the valuable design unlettered, and be safe; though common prints, they may not!

If, for "artist's proofs," publishers used the term "fine-paper copies," they would be nearer the truth, and consistent with their practice of issuing them on india paper; but then, "fine copies" would imply publication, which they wish to ignore. Fancy a book-publisher contending that fine-paper copies were not a publication of his work! But the two things are synonymous.

Possibly, at the time J. S. W. wrote, there was (as he states) no legal decision that the issue for sale of *any* unlettered copy vitiated copyright: but now there is, and by no less an authority than Vice-Chancellor Kindersley (Lloyds *v.* Ashfords). Photographers may calmly await decision on the meaning of "prints," should that objection be hardily taken into court. And printsellers must recollect, that no inferential meaning can be imputed to a penal Act, which must be construed just as it is, as it plainly reads; no more nor less.

J. S. W. has not noticed my objection, that the absence of a proprietor's name (as required in the Act just quoted) will vitiate copyright in an engraving. Does not, in this case, "silence give consent" to my statement? and if so, how many engravings will stand that test?

J. S. W. pleads, in answer to my complaint of print publishers refusing to photograph their works, that "surely, with all their faults of omission and commission, they might be left to manage their affairs as their experience tells them will best repay them for their enterprise." No doubt; but, having deliberately chosen the one course and rejected the other, why do they howl at those who take up the leavings? On one hand they say that the issue of small reproductions of their works kills the sale of larger copies; on the other, they reject production by themselves of small copies, as unworthy attention! So one may see an angry child dash away a proffered cake, and then rave against those who pick it up.

If they have injury, the law is open. But let them not strive to cobweb round a plain case, and hide their own shortcomings by tortured misconceptions of the very Acts to which they threaten an appeal for redress,—Sir, your obedient servant,

DETECTOR.

January 30, 1865.

MR. POUNCY AND CARBON PRINTING.

SIR,—With a singular pertinacity of recurrence, the claims of Mr. Pouncy in connection with carbon printing, are once more brought before the photographic world. First in a paper by himself, printed in your journal a fortnight ago; and next by one of the over-zealous injudicious friends, by whom he has the misfortune to be surrounded, in a letter in the last number of one of your contemporaries. Few men have had more occasion to exclaim, Save me from my friends, than Mr. Pouncy. The inflated, foolish and false flattery of fulsome friends have done much in the first place, to lead him to believe, in the face of the most unchallengable evidence to the contrary, that he is the inventor of carbon printing; and in the next place, that he has brought it to a degree of perfection which promises for it a speedy practical adoption. The first error is of little consequence, except to Mr. Pouncy and his friends, as constant reiteration of that which is so easily proved to be untrue, has no effect on the public mind, beyond producing a feeling of annoyance and contempt.

The second error is one of more general consequence to the public, and to the art, than the first, as it effectually tends to retard progress in a really valuable invention ;for so long as Mr. Pouncy believes in the present perfection of his process, so long, it is probable, will he pursue the narrow-minded policy which has guided him hitherto, of persevering in a foolish silence or reticence, regarding all details not absolutely necessary to be made public in the specification of his patent, and so effectually deter others from experimenting in a path in which he evidently deprecates, rather than invites, co-operation. As no photographic process, or indeed any other process of art or science, is likely to attain perfection through the efforts of one totally unaided man, we cannot hope for much of a perfect or practical character in his process, until the united suggestions of many minds, and the skill of many hands, have been brought to bear upon it. I have no intention of following the writer of the letter I have alluded to, Mr. W. Wallace Fyfe, through his long series of assertions, unsupported by one tittle of proof, but having read Mr. Pouncy's paper before the Photographic Society of Scotland, and the remarks thereon; having read also the able article in the journal of the Photographic Society, briefly reviewing the progress of photography during the past year, in which Mr. Pouncy's productions and claims are referred to; having, moreover, been an early experimentalist in carbon printing; having seen Mr. Pouncy's specimens, and having taken a deep interest in his, and all other progress in that direction, I cannot forbear making one or two observations thereon.

Before entering into an examination of the subject, permit me to make one remark on the passage in the Society's Journal. Mr. Fyfe seems to perceive an "absurdity," "glaring contradictions, and preposterous inconsistencies," which "can only be dictated by sinister motives," in the remarks of the *Photographic Journal*, to the effect that Mr. Pouncy's modifications are really ingenious, although not admitting at present of very perfect results. It appears to me, sir, that no more just appreciation of Mr. Pouncy's real claims could have been expressed, and the inconsistency, absurdity, or contradiction, I am utterly at a loss to perceive. Mr. Pouncy's modifications are, undoubtedly, ingenious: he has, as undoubtedly, made some progress, and the most that his violent and injudicious partisan, Mr. Fyfe, ventures to claim for him, is "*all but*" perfect results. In regard to the *Photographic Journal*, I, in my simplicity, had regarded the article on the "Past Year," as one of the best evidences of the promises of renewed vitality, as a healthy, out-spoken expression of opinion.

It is entirely new to me, that the *Journal* had been, hitherto, in the habit of affording either discouragement or aid to discovery or invention, its chief fault, in the eyes of photographers generally, having been that it neither ascended above, nor descended below, the dead level of amiable respectability.

I will now, very briefly, proceed to examine the grounds upon which Mr. Pouncy's claims to be the discoverer of carbon printing depends. In 1855, M. Poitevin patented in this country, as well as in France, a method of producing photographic images in carbon. In his specification, now before me, he says—

> I apply various liquid and solid colours upon paper, cloth, glass, and other surfaces, by mixing such colours with the aforesaid mixture of a chromate or a bi-chromate with organic matter, and applying this new mixture or combination to the paper, or other fabric, or surface.
>
> The photographic impression is produced upon this prepared surface by the action of light passing through a negative photographic picture, or an engraving, or other similar object or screen, or in the camera obscura, and it is then washed with a sponge and a large quantity of water.
>
> The albumen, or rather organic matter, is rendered insoluble at the parts where it has been acted upon by the light, and the design is thus produced in the colour which has been employed.

In 1857, M. Beauregard patented a similar process with some modifications, described in his specification, thus:—

> This invention relates to the production of photographic images, pictures, or proofs, without salts of silver. For this purpose, carbon or other pigment is employed; and it is fixed on the paper or other surface by means of a preparation which is acted upon by light. If gelatine or gum be added to a saturated solution of bichromate of potash and ammonia, and the mixture, after being dried is exposed to solar light, the gelatine or gum is rendered insoluble in water.
>
> If, before exposing the mixture to light, an insoluble colouring material is added to it, such as carbon or black lead for a black colour, &c., or other pigments, or mixtures of pigments, the results is when the mixture is exposed to light. and thus rendered insoluble, the colouring matter or pigment is imprisoned and retained by the mixture, and rendered indelible. When such a preparation is exposed to light, under a photographic negative, or other transparent, or partially transparent picture, and is afterwards washed with water, the pigment becomes fixed at those parts where the light acts upon it, but is removed by the water from the parts which are sheltered from the light, so that the picture is reproduced in a similar manner to that in which pictures are reproduced by the ordinary photographic processes with chloride of silver. This mode of proceeding is not new, but in applying this principle in practice there are certain difficulties to overcome, thus it is necessary to preserve the whiteness of the paper in the whites of the picture, and to prevent the adhesion or fixing of the pigment or colouring matter in the parts which have not been exposed to light, and also to employ the pigment in an extremely fine state of division.

In 1858 Mr. Pouncy announced, in the *Photographic Notes*, his discovery and intended patent of a similar process, but was dissuaded from going to the expense of a patent on the ground that a similar process had been already patented by M. Poitevin. Perhaps the most satisfactory evidence which can be educed as to the character of the real facts will be a reference to an authority who has always been favourable to Mr. Pouncy. In the *Photographic Notes* for November 1st, 1858, Mr. Sutton gives a summary of carbon printing as it then stood. To Mr. Mungo Ponton he ascribed the first step in these processes; the next step he attributed to M. Poitevin, in 1855: the next to Mr. Beauregard, in December, 1857; the next step he says was taken by himself, and described in January, 1858. He then adds—"Now comes the part which Mr. Pouncy has played in this matter. In the month of March in the present year [1858], that is, about two months after he had seen the remark in this Journal (to which he has been a subscriber from the first), he enclosed us some carbon prints, in which the whites were clean and the blacks black; and on the 10th of April he patented the process provisionally." He subsequently adds, in the same article, "to us it appears that Mr. Pouncy was the first to produce a presentable carbon print." Now, as the question of what constitutes a *presentable* carbon print must be a matter of taste or opinion, and as the discussion is not as to who first produced presentable prints, but as to who originated the process, it appears to me that this is tolerably conclusive evidence against the claims I am combatting.

These are facts resting on published data, and not upon the assertions of any of the partisans of the gentlemen concerned. Mr. Pouncy and his friends ignore these facts, and in support of their assertions thereon resort to a process familiar to the readers of sporting journals, but happily unknown and unrecognized in support of scientific and historic truth. Because the two first-named gentlemen are residents in another country, and probably never by any chance become acquainted with Mr. Pouncy's magnificent offer of £5 a piece for any copies of carbon printing produced at an earlier data than his own; because, even if such an offer came under their notice they would probably treat it as a piece of foolish gasconade; and, because, if they too regarded it as a *bonâ fide* offer, and produced the desired evidence, it would probably be very difficult, if not impossible, to satisfy Mr. Pouncy or his friends of their authenticity and prior date to his own; therefore, it is to be assumed that two gentlemen of acknowledged scientific reputation and position incurred the expense of patenting in two countries processes which they had never tried, and, in short, had not discovered! Why, sir, is not the proposition an insult to common sense?

Let me be distinctly understood. I do not wish in any way to detract from the ingenuity and indefatigable perseverance of Mr. Pouncy, nor in any way to depreciate the excellence of many of the prints he has produced, some of which I have seen and admired. His aim is a most laudable one; the production of photographs in a material so permanent as printing ink, is an end to be desired by all lovers of the photographic art, and I heartily congratulate Mr. Pouncy on the measure of success he has attained. I think it is quite possible, moreover, that his efforts and results have scarcely met with the full meed of public appreciation. His own unfortunate tendency to secretiveness, and the injudicious laudations and absurd claims of his friends are, I believe, chiefly responsible for this. The opinions of a crotchetty and superannuated *savant* are not regarded by the photographic public as strong evidence of the perfection of processes or pictures he praises. The general silence of the members of the Photographic Society of Scotland speaks volumes as to the general impressions of the claims made. The enquiries of a recent letter writer, signing himself "One who wants to know," in a contemporary, who asks for formulæ, how to make sensitive ink; the proportions of bichromate; how much greasy matter, and of what composed; which of the many kinds of ink—copperplate, lithographic, or letterpress—may be used; how the transparent paper is made; and how the sensitive ink is applied to it? and many other questions on which Mr. Pouncy has never afforded any information, are really the enquiries of photographers at large. When Mr. Pouncy is prepared to answer these enquiries, he may feel assured of a much wider interest in his process. When he, or any one else, is prepared to undertake printing by his process on a commercial scale, he may feel assured of a more general appreciation of his method of printing at its true worth, and when he is willing to accord to fellow and prior labourers in the same field their due meed of credit, he may be assured of a more general recognition of his own real claims.

J. Carus Crofton.

Photographic Notes and Queries.

Blisters in Albumenized Paper.

Sir,—A correspondent in your last wishes to know the cause and remedy of blisters; I have invariably found that blisters first show themselves in the fixing bath, and increase in size and numbers when transferred to the washing; they generally occur with papers which have been very recently albumenized (a few days), and will continue to decrease as the albumen sets or hardens with age.

A batch of paper I received two months ago in this fresh state was quite moist to the touch, gave blisters of unusual magnitude, and left unmistakable traces of their whereabouts after the prints were dried and rolled.*

As I said before, blisters don't show themselves till fixing, and if your correspondent will add half an ounce of spirits of wine to the fixing bath, he need not fear their appearance.—I am sir, yours truly, J. P. Green.

Lime in the Toning Bath.

Sir,—I had long suspected that the lime, in the lime toning bath, was the only useful ingredient, and that was to neutralize the free acid; the chlorine being harmless in proper quantity, and injurious in excess; but I was too idle, or otherwise employed, to go to the trouble of testing its accuracy, especially as my toning never gave any trouble, and always worked best on the day mixed.

Seeing Mr. Heisch's views on the subject, that the chloride of calcium was the active ingredient, I became more convinced than before that my views were correct; and I made the following experiments:—

A bath was made exactly as described by Mr. Heisch, with chloride of calcium; and one containing one grain of chloride of gold to a few drachms of water, neutralized with lime water until a strip of litmus paper, in the solution, turned from red to blue; more water was then added, to make it up to eight ounces.

I tried the two baths soon after being made, and found they both worked very quick, and gave excellent results: in fact, I could see no difference between the two; and the next day they worked as well as the first, and as fast. An excess of lime water seems to do no harm.

I found, however, which I did not expect, that they must be taken out as soon as the desired colour is obtained, or, otherwise, they change as in a chloride of lime bath; and both of my baths did the same, that is, the chloride of calcium bath, as well as the lime-water one.

I, therefore, come to the conclusion, that a gold bath neutralized with lime water is all that is required, and that the chloride of calcium is useless. I send you, Mr. Editor, a print from each bath of a weak negative, removed too soon for the black colour, which is easily obtained. Yours truly,

T. S. Reeves.

Plymouth, Jan. 26th, 1865.

[Both the prints are very brilliant and excellent in tone.—Ed.]

◆

Talk in the Studio.

Medals of the Scottish Society.—The Photographic Society of Scotland distributed more than its usual number of medals at the present exhibition, a pleasing indication, we may fairly infer, of the unusually large proportion of meritorious pictures. The awards are as follows: Mr. H. P. Robinson; (London) portraiture, for his portrait of "Brenda;" Mr. James Mudd, (Manchester) landscape, for his view of "Dunham Park," Mr. Thomas Annan, (of Glasgow) best view in Scotland, for his "Dumbarton Castle;" Mr. John Smith, (Darnick Tower) best view by an amateur, for his picture, "On the Leader near Melrose;" Mr. J. Ramsay L'Amy (of Nether Byres) for the best group; Mr. Samuel Highley, (London) for a series of microscopic objects enlarged for the magic lantern; the Pantascopic Company, (London) for panoramic views taken with the pantoscopic camera.

Waterproof Colouring for Photographs.—Mr. L. Bing recently introduced to our attention some specimens of coloured photography, effected by a process which he is, we believe, prepared to teach to photographers. The method he stated to be simple, and easily acquired, and was certainly effective. Its especial characteristic was the perfectly waterproof character of the colours. We saw completed prints immersed in water, and then rubbed without the slightest disturbance of the colour.

Magnesium is the lightest of the fixed metals, its specific gravity being 1·704, which is about one-tenth of the weight of gold.

Copyright in Engravings.—On Friday last, at Birmingham, William Congreve Gregg, printseller, was summoned at the suit of Mr. Ernest Gambart, publisher of engravings and photographs, under the 24th and 26th Vic., cap. 68, for unlawfully selling a photograph copy of the "Derby Day," Mr. Gambart being the registered proprietor of the copyright of the photographic copy of the engraving of the "Derby Day," also his property. Mr. Webb, solicitor, appeared in support of the prosecution; the defendant did not appear. Mr. Gambart produced a certificate of the registration of his copyright. Mr. Boydell Graves, print-publisher, proved that on the 7th instant he purchased from the defendant, at his shop, a photograph copy of the print of the "Derby Day." After some discussion between the Bench, the Justices' Clerks, and Mr. Webb, on the question of guilty knowledge, the Bench fined the defendant in the mitigated penalty of 10s. and costs, or three days' imprisonment; with an intimation that, if there had not been some doubt as to the proof of the guilty knowledge, the full fine of £10 would have been inflicted, with corresponding imprisonment.—*Birmingham Daily Post.*

Photographs of Diplomatists.—The correspondent of a daily contemporary says:—"Another use has been found for photography, and cartes de visite bid fair to supersede the *Almanach de Gotha*, and its young rival, *L'Almanach de Paris.* All the Eastern Governments now send over constant demands for photographs of the Sovereigns, Ministers, and diplomatists with whom their ambassadors may come in contact during a mission to Europe. The making of diplomatic albums is quite a trade here; whilst Annam, China, Japan, and other far-off lands receive regular consignments of pictures of "who's who in 1865." The idea is, I think, as useful as it is ingenious. Better despatches can be written, and better instructions given, if you know to whom they are to be delivered. After seeing the photographs, for instance, of the Emperor Napoleon and the King of Italy, nobody would dream of addressing them in the same style. Not being a practical photographer, I do not know whether this would equally apply to our receiving pictures of our coming visitors. Can you photograph a black man? Will he come out an unnatural white? If so, we had better wait till we see our envoys in the flesh; but for them the advantage is obvious."

Photographic Maps.—A map of the town of Grenoble and its environs, embracing twenty square kilomètres, has been produced with the aid of the camera in a very short space of time. The immediate object in view is the obtaining correct topographical profiles for military purposes, and, consequently, the means of placing an attacking force comparatively out of the reach of danger, but maps showing the undulations of the land are of too evident utility to require any special application to illustrate their value. The map in question is made to a scale of one in five thousand, and was entirely produced in Paris from twenty-nine photographic views taken from eighteen different points, by Captain Javary. The stations selected were partly on one side of the river Isère, and partly on the other, and it is believed that not a single accident of the outline has been missed. The extreme elevation of the ground on the right bank of the river is more than three thousand feet. The shortest distance at which a view was taken was about a thousand yards, the greater part were at fifteen hundred yards, and some few as distant as four thousand five hundred. It is stated, on the authority of M. Laussedat, with whom the plan originated, that the fitting of the levels is such as could not have been produced by any other known method of expeditious military reconnaissance. The views were taken by two lenses of different focal lengths, namely, one of fifty centimètres, the other at twenty-seven. The former was employed for tolerably large representations and objects at a distance, or where it was found necessary to take special notice of details, and the other, which took in a field of 60°, for the shorter distances. The photographic operations only occupied about sixty hours, and the subsequent preparation of of the map two months.—*Journal of the Society of Arts.*

Copyright and Piracy.—We understand that the photographers engaged in photographic reproduction are about to meet the print-sellers in their own manner. The latter having formed an association for the purpose of prosecuting alleged pirates, the photographers are about to form an association for their defence against prosecutions instituted where no real copyright exists. Such an object is laudable, where the defence is confined to groundless and vexatious actions against individuals, which are at times intended to frighten persons into a submission which the law would not enforce; but the managers of the new association must be very careful to avoid sanctioning or defending actual piracy, as such a course would at once cause them to forfeit the sympathy of respectable people. Our correspondent signing "Detector" is anxious to receive letters from any one interested in the subject, which may be addressed to the care of our publisher.

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* The surface of this paper is now quite hard, and gives prints free from blisters.

Photography and the Magic Lantern.—Photographic transparencies are steadily taking the place of the old class of painted slides for the magic lantern. At a recent conversazione of the Geological Association, Mr. Highley exhibited by the aid of the magic lantern, and oxyhydrogen light, a series of scientific subjects, and called attention to the accuracy and educational value of photographic delineations of such subjects over those drawn by hand. Any of our readers interested in geology, may learn more of this Association by applying to the honorary Secretary, Mr. J. Cumming, 7, Montague Place.

To Correspondents.

B. L. G.—You may with propriety develop a simply iodized collodion with iron, and if everything is in good condition, obtain very good results. You will find that during the cold weather it is much easier to obtain detail with iron than with pyrogallic acid, even with a simply iodized collodion; but you will obtain good results still more easily by using a good bromo-iodized collodion.

W. S.—We have worked with No. I and found it excellent, both in definition, covering, and rapidity, and from what we learn think it superior to No. 2. We believe the triplet about which you enquire to be a good instrument, but we have not had opportunity of testing it personally.

T. Nicol.—The lens you mention will answer for copying very well, except that straight lines will be rendered curved in the picture. 2. You cannot lawfully copy the engravings in the *Art Journal* without permission. 3. Both the dealers you name are respectable men. As a rule we should recommend new to secondhand apparatus, unless the latter be selected by a person of judgment.

Wm. Bartholomew.—Thanks for the suggestion, which we will take opportunity of trying.

Helandrust.—In our experience, No. 1. Regarding the card lens you mention, we should not expect it, as a rule, to cover satisfactorily with full aperture. With many good lenses, great care is necessary in focussing to secure the sharpest result. Do you use a focussing glass?

H. Y. R.—If any trace of hypo were in the washing water employed for dry plates, we should be very doubtful of the result; but you can only obtain certainty on the subject by trying one or two.

Devon.—A lens of 11½ inches equivalent focus is unnecessarily long for cards, and introduces several difficulties. It will, in the first place, be somewhat slow; and will, in the next place, require a very great distance, probably about 26 feet, between the sitter and the lens. This may not appear of consequence if you have a large room, but if the atmosphere be at all thick, you can with great difficulty secure brilliancy when working through such an extent of atmosphere. For cards we should prefer No 2 on your list. For whole plates *a* in your list will be good, but it will not answer for anything larger than whole plates; *b*, *c*, or *d*, we have had no experience with, and have heard varying accounts. We have recently seen some very fine pictures on 12×10 plates taken with the No. 4 whole plate of No. 2 maker.

J. F. Naddismeri.—We believe, both the Stereoscopic Company and Marion and Co., publish Mr. England's stereoscopic views.

Photo-Assistant.—Thanks for your communication. We are obliged, personally, for the information; but a moment's reflection will show you that we cannot publish it. We cannot undertake the invidious task of indicating by name the manufacturers whose work we personally prefer, much less could we with propriety permit it to be done anonymously by correspondents; such a course would be at once taken advantage of by unprincipled persons to institute a system of dangerous puffing. We do not doubt the disinterestedness of your communication, and we know that many of the cheap French lenses are good, we have seen good ones; but the difficulty is that with cheap instruments a certain risk must be run; you may get a good lens or you may not. The system of manufacture necessary to secure cheapness precludes absolute certainty of excellence, and the price does not permit the manufacturer to examine and reject rigidly everything short of the desired mark of excellence. To secure the greatest perfection in lenses requires the constant personal attention of the skilled optician to each instrument. This attention is given by the high-class English opticians who have a reputation to sustain; and such a mode of conducting business precludes the possibility of very low prices.

S. Johnson.—The best mode of dealing with old Daguerreotype plates is to sell them to a refiner. There is no simple and readily available mode of removing the silver and preserving the copper.

M. P.—Except where the common water is very impure it is not necessary generally to use distilled water for developing and toning baths. Some photographers prefer hard water for the silver bath on which paper is excited, as having less tendency to discolouration.

Photo. Amateur.—Mr. Atkinson, of Liverpool, is the English agent for the Globe lenses. The stereo lens would, we doubt not, cover a card-sized view. The price is somewhat high, but we do not remember the exact amount. There is no triple lens of sufficiently short focus for such views. We should recommend for the purpose the compound stereo lens of short focus.

A Northerner.—We did not notice the questions in the latter part of your communication, received some weeks since, until a few days ago. Your process is no infringement of any patent. 2. We do not know much of the lens in question. A single lens ought not to give the misty spot in the centre to which you refer. When it does so it is the result of imperfect mounting. We have published from time to time all that we know of the Wothlytype process. You will thus be enabled to form your own judgment upon it.

W. H. Warner.—If you add a chloride of any kind to the sizing material applied to the paper to be used with collodio-chloride of silver, you must either add a very large proportion of free nitrate to the collodion, or lose vigour. One of the conditions of vigour is the presence of free nitrate; but if there be a chloride on the paper the silver will combine with it, and leaving no free nitrate, a lack of vigour will be the consequence. In the experiments we are prosecuting we are endeavouring to dispense with any sizing of the paper at all. We have not yet satisfied ourselves as to whether the special chloride used affects the tone or not; but the subject is receiving our attention. Thanks for the suggestion as to the name. We will consider it.

N.—It is probable that both Mr. Sutton and Mr. Hughes had, in common with ourselves, overlooked or forgotten the camera stand described in the News, Vol. III, p. 365, in which the screws for adjusting the camera with great exactness are given. Mr. Hughes's allusion was to a description in Mr. Sutton's pamphlet "On Instantaneous Dry Collodion Processes," p. 77, in which, describing a camera, he says: "in the bottom is a flat brass ring, by which the camera is sustained upon the points of three screws which work through the corners of the bronze triangle, and by means of which the camera is easily and quickly levelled after the tripod has been firmly planted in the ground." The stand appears to be the ordinary tripod without ball and socket. The stand to which our correspondent alludes, described in News five years ago, appears to answer every possible purpose, both for adjustment and firmness. Our correspondent adds, "I have used this stand for four years, and have no other improvement to suggest than that there should be brass sockets for the male screws to work in, they would work more freely. The ball and socket movement shown, may be used alone, in fact, I generally set my instrument by that, and *when set*, if using my heaviest camera (with swing back), I screw up the long screws until they touch the under part of the table. The support is so firm that a very heavy weight might be placed on the table without disturbing it."

G. R. Gill.—Thanks for the interesting communication. It shall appear in our next.

J. F. Moal.—You mistake: we have expressed no doubt of either your word or your memory; but merely pointed out that without a published record there is a want of that certainty which the public desires in such matters. It is always a pity, when any discovery worth notice is made, not to put it on record at once in a manner which settles its date and origin beyond dispute. You do not still send us any examples of what you have done. Send us details of your method, and specimens of the results, that we may now give your claims publicity. We are quite willing for the public to decide.

Ophelia.—The size of the condenser used with the ordinary solar camera is about 9 inches diameter, and about 18 inches focus. We cannot tell you the price of one. The portrait lens must be placed so that the focus of the condenser falls on the front lens of the combination. The negative is placed near the condenser; the exact position is not important.

Willem Mac-Nicol sends us a long letter emphatically asserting his claim, disallowed by Mr. Werge, to the invention of the vignetting camera described in the last paragraph of Mr. Werge's communication on methods of vignetting, in our last. As the chief occasion for the assertion of Mr. Mac-Nicol's claims arises out of certain counter claims and correspondence in a contemporary, and the matter is one rather of personal than public interest, we cannot, in justice to our readers, occupy more space than is necessary to give publicity to the fact that Mr. Mac-Nicol claims the invention of the camera in question. On the subject of camera vignetting, we may remark that as almost every subject requires different treatment in shape, size, and gradation of the vignette, no fixed system can give the best results. The best method of vignetting a negative is, in our opinion, that in which a screen, with a serrated aperture, is placed between the sitter and lens. This is very simple and admits of some variation in size and shape.

J. Beattie, Peter Henderson, F. Howard, and several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. Josiah Gaoom, Wyle Cop, Shrewsbury,
Photograph of Thomas Ellis, alias John Morgan.

Mr. A. S. Watson, 2, Regent Road, Great Yarmouth,
Photograph of Father Mann, Catholic Priest, Great Yarmouth.

Mr. Charles Sands, 13, St. James's Street, Brighton,
Photograph (from Water-colour Painting, by — Phillips, Esq.), of Edward Kentfield.

Mr. Edmund Eccles, Bury, Lancashire,
Two Photographs of Right Hon. Frederick Peel.

Mr. William George Helsby, Liverpool,
Fourteen Photographs of Sculpture Stations of the Cross, St. Francis Xavier's.

Mr. Edwin Flukes, 41, Milsom Street, Bath,
Photograph of Design of proposed Bath Fountain House, by C. E. Davis. Esq., F. S. A.

Messrs. Appleton and Co., Horton Lane, Bradford,
Three Photographs of W. E. Foster, Esq., M.P.

Mr. George Bruce. Dunse, Berwickshire,
Photograph of the late Alexander Campbell, Esq., Surgeon, Dunse.

Mr. F. R. Ryles, 180, Waterloo Road, Burslem,
Stereo-Photograph from Marble Bust of Josiah Wedgwood, F.R.S., F.S.A.

THE PHOTOGRAPHIC NEWS.

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THE LONDON PHOTOGRAPHIC SOCIETY.

On Tuesday last, the Twelfth Annual Meeting of the Photographic Society of London—correctly speaking, we ought to be able to say of England—was held, and the report of the Council presented to the members. This report, the first since February, 1862, was looked for with considerable interest, as the gloomy vaticinations which have preceded the annual meeting for some years past, have been more than usually rife on this occasion. One of the Vice-Presidents had, in his place in the chair, expressed his conviction, that the Society was not in a satisfactory condition, that it needed, and must have, reform; and various preliminary steps in that direction had been announced. It was natural, therefore, that the report should be looked for as an ample exposition of the future policy of the Council.

We fear that, in this respect, the report will disappoint many. We do not say this in a captious spirit. We are no pessimists. We know it is easy to find fault, especially in vaguely-sweeping and comprehensive terms. Nothing is easier than general denunciation or *ad captandum* abuse: nothing, perhaps, pleases the vulgar more, or makes the judicious grieve so much. Deprecating then everything like captious fault-finding, we cannot help expressing some disappointment with the report, or rather with its shortcomings. We cordially endorse the preliminary remarks as to the importance of a representative society, and its beneficial influence on the art; and, we think, a very strong case for the Society and its usefulness is made out by the fact, that the only deficit in its funds arises from the circumstance that it has year after year maintained a public exhibition of photographs at a constant loss. This has been a worthy purpose, and we think, notwithstanding the loss, the funds have been well expended. But we are not satisfied with the report, because of its incompleteness: it is not a complete record of the progress of photography and of the Society's influence thereon in the past, and it affords but little indication of the nature of the increased activity promised in the future.

The year which has passed since the last annual meeting has been unusually prolific in matters of photographic interest: very early in the year, a crowded meeting of members assembled to hear Mr Swan read a paper on his improvement in the carbon process,—a subject which occupied the active attention of photographers for months afterwards. At another meeting, the magnesium light was brought forward, and its application to portraiture, and to the solar camera illustrated. Still later the question of uranium printing was introduced to members, who listened with eager interest. An able paper on the tannin process; a paper on a mode of printing, which had been kept a secret much coveted by photographers for years; a paper on transferring negatives; together with several other important subjects, have been brought before the Society. It is a somewhat wholesome custom, in an annual report, to give a resumé of the subjects which have occupied a society during the year; but if it were not worth while to do this, surely the first three subjects we have named refer to novelties of sufficient importance to have been worthy of some notice by a body of gentlemen occupying such a representative position.

But there are subjects of vital importance to photographers outside the society, which might, with propriety, come under its attention. The question of copyright is one of these. The existing law of copyright is uncertain in its provisions, and unsatisfactory in its working. During the last session of Parliament, a new Bill was brought before the house, with clauses vitally affecting the interest of photographers. It was withdrawn in order that a more complete and consolidated Bill might be brought before the house during the present session. Has the Society taken any interest in this question, or does it intend to bring its representative influence in any way to bear in favour of photographers?

This question brings us to the future. What is to be the nature of promised reforms, and how is increased activity to be secured? Are we to have a revised code of rules? Upwards of half a dozen years ago this was promised: "The laws," said the worthy Chief Baron, "although adapted to an embryo state, were undoubtedly liable to objection," and a promise of revision was then made. Nothing of the kind has been done, and we question if at this moment one-tenth of the members know what the rules are. It is high time the subject received attention, and we commend it to the early consideration of the new Council.

Regarding papers for the future, how is a supply, not simply of papers, but of papers worthy of the Society, to be secured? The excellent suggestion of a "Member of the Council," recently made in our columns, as to each member of Council being responsible for a paper, is well worthy of consideration, and doubtless the "Member" will, in his place in Council, endeavour to give force to this and other suggestions. But we think there is something more to be done. Has the Society or its Council ever made any specific effort to secure the highest excellence in its papers? Has it any rewards or inducements to offer to secure this excellence? Has it any medal or order of merit to confer on the reader of pre-eminently valuable papers, the discoverer of important processes, or the producer of anything especially excellent in the art or its belongings? We should like to see some award of this kind offered as an inducement to excellence of all kinds, but especially would it be valuable for good papers. Useful discoveries of course deserve such awards; but if they do not receive them, there are modes of securing commercial remuneration not open to the reader of valuable papers.

The question of medals brings us to another omission in the report. No mention whatever of the awards at the last exhibition was made. They were, it is true, duly announced at the time, but we naturally expect, in a report of the Society's progress, that some record of the medals awarded should be preserved. Touching medals: have the awards ever been really made other than on paper; have the medals really been given? We have never seen or heard of one, either for the prize pictures of last year, or the year preceding; and it is a somewhat sad thought that some to whom these awards were made, pass from among us without receiving the tangible honour. It is scarcely necessary, we apprehend, to emulate national modes of dealing with prize money.

Regarding the financial position of the Society, we do not consider it unhealthy. Its income exceeds its expenses in all matters, except the exhibition, which has during the last two or three years caused a deficit. The money, as we have said, we consider well spent; but it is clear that it cannot go on much longer: on this subject we have a suggestion in another column. The promise of the Chief Baron to secure if possible, apartments for the Society in Burlington House, will lessen the expense as well as provide a more congenial home. It is, moreover, a serious disgrace to the Society, or its members, that a sum very close upon £200 should be due in arrears of subscription. Has the Council considered the propriety of putting in force the rule provided for cases of this kind?

We have hastily written a few questions, and a few suggestions, in no spirit of antagonism to the Society. We believe that the honour of the art is largely concerned in maintaining the position and prestige of the representative Society. It has all the elements for a prosperous and high position. Its President is one of the ablest judges of the land; a gentleman who since he distinguished himself as a senior wrangler, considerably over half a century ago, has grown steadily in honour and position. Its Vice-Presidents and Council include some of the most esteemed and honourable names connected with the art, science, and practice of photography. Its Secretary has had perhaps the oldest and most comprehensive experience in every branch of the art of any man living, possesses the honour of being the practical introducer of the collodion process, and is besides a scholar and a gentleman. Surely, then, a Society of nearly four hundred members, with such officers, ought to occupy a position not only proud and prosperous, but unimpeachable and impregnable.

A GUARANTEE FUND FOR PHOTOGRAPHIC EXHIBITIONS.

From the report presented at the last meeting of the Photographic Society, it appears that for years past the exhibitions have involved a loss to the Society, the cost far exceeding the income. The accounts of the two last exhibitions each shewed a deficit of over £100. It is quite clear that such a state of things could not be prolonged indefinitely. However willing the Society might be to promote the interests of the art, a time must come when they could no longer afford to do so at a heavy loss. That time, it appears, has already arrived; and although some short exhibition is talked about, the Society cannot at present incur the risk of another exhibition held in the ordinary way. The sources of the failures, in a commercial sense, of these exhibitions it is unnecessary to discuss here: they doubtless spring from various causes. Neither is it necessary to enlarge on the importance of such exhibitions at once as landmarks of progress and incentives to further improvement. Photographers generally recognize this. Our aim is now to propose that all interested in the continuance of the exhibitions should form a guarantee fund to meet any loss arising therefrom. Let the exhibitions be held under the auspices of the Society as heretofore. Let a committee of management be chosen, half from members of the Society's council, and half from the body of the guarantors. Should it happen, by any chance, that a good and well-managed exhibition be a success, let the profits go to the funds of the Society. Should there be a loss, let it be made up out of the guarantee fund, subscribers only being called upon to contribute in the definite ratio for which they, in the first instance, make themselves responsible. We have not time or space to suggest further details now: but shall be glad to receive communications from any of our readers interested in the subject.

PHOTOGRAPHING ON PAINTERS' CANVAS.

The superiority of canvas, as a basis for oil painting, is well-known to artists, and hence it has been considered important to devise some means of printing the photographic image on the prepared canvas which the painter prefers for this class of work. The various methods proposed have not been very successful, and have involved much trouble in preparing the surface of the canvas, so that it shall not repel aqueous solutions; considerable rubbing with alcohol or alkaline solutions being necessary. In the course of some recent experiments, we have discovered a very simple method of effecting the desired end, and securing a very good result. It consists simply in coating the surface with our preparation of collodio-chloride of silver, exposing under a negative in the usual way, and then toning and fixing as would be done with a paper picture.

We have used the fine canvas used for delicate work, silk being the tissue, we believe, on which the ground is laid, and have found no difficulty of any kind in getting good results. Of course, after the printing is completed, the canvas can be stretched upon a frame for use in ordinary way.

It is, perhaps, necessary to observe that some care should be used in selecting a suitable sample of collodion. If it be of the tough and horny kind, it will be liable to leave the canvas, and spoil the work, when it is, perhaps, completed. But if it be of the kind distinguished as giving a powdery film, it will adhere with perfect tenacity, and can only be removed by the use of a solvent.

ON TAKING TWO OR MORE POSITIONS OF THE SAME PERSON IN ONE NEGATIVE.

BY G. R. GILL.

My method of producing one picture containing two portraits of the same person was obtained after many fruitless attempts.

A black velvet screen, just before the sitter, I soon saw was useless, because the edge would be lit up on one side, and in shade on the other. I, therefore, sought my end in that wondrous wooden eyeball, the camera. Here I tried the effect of shutters close to the negative, but all in vain, as the division was seen by a hard line. After some further attempts, I found out a part, between the lens and the negative, where the outline seemed so lost as to be invisible. This I found to be just what I had desired. But great nicety in the adjustment was indispensable. For this rough attempt, I formed a framework inside the camera, with an opening a little smaller than a carte-picture, which would just admit all the rays of light upon the negative I required; and if my researches had gone no further, this alone would have repaid me, as no end of worse than useless light is stopped ere it arrives at the dark slide holding the negative.

Having now a small opening in the centre of the framework, I proceeded to make shutters of zinc to work in grooves to a centre, the ground glass being divided by a vertical line, over which no part of the separate pictures must be allowed to project. I focussed with the left shutter closed, and then sat, and my assistant opened the lens; the dark slide was then removed, and the shutters reversed. The remaining half of the negative was thus obtained. In that place of distracted brains—the dark house, with the well-known appliances, I soon found that all was successful. I had a negative of me and myself as painter, sitter, and the easel with my portrait upon it, standing in the middle of the picture, taken by two exposures, and yet no sign of division.

My next satisfactory experiment was to place in the opening of the dark frame a black card, with four eliptical apertures, and a revolving disc with a part cut out, to admit of one elipse being seen at a time. By this method I obtained four portraits of different persons, or different expressions of the same person, shifting, of course, the disc and camera at each sitting; the result was four pretty vignetted pictures upon a black ground, which, by means of a vignetting screen, arranged for the purpose, I converted into a double vignette, upon a white ground, which, were it punched, would, I think, far surpass a diamond cameo.

[Mr. Gill forwarded us, some weeks ago, a very clever picture with the portrait of himself in different positions. He has since shown us many others with very quaint groupings of the same person on the same negative, but no trace whatever of marking or division in the background. On another page will be found an article from *Humphrey's Journal* on the same subject. It is somewhat curious that this odd application of the art should revive, apparently without concert, in France, America, and this country, almost simultaneously.—Ed.]

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ON THE BATH OF SUGAR OF MILK AND IRON.

BY DR. P. J. KAISER, OF LEYDEN.

Some time ago I recommended, in the Abbé Moigno's journal, *Les Mondes*, an iron bath possessing peculiar properties, which gave remarkable results, especially in instantaneous photography. In its composition, this bath has some analogy with the iron bath recommended by eminent authorities, in which the saccharate of iron sets the silver at liberty, which is precipitated upon the iodide of silver decomposed by light. I have with much success replaced the saccharate of iron by a mixture of an aqueous solution of sugar of milk, and a similar solution of sulphate of iron. Many manufacturers of photographic products have, after the publication of my article, advertised the saccharate of iron as a developer; and it appears to me, that they have attributed the same properties to this salt as to the sulphate of iron in conjunction with sugar of milk; whereas the difference between these two salts is very great.

No one, I believe, will deny that the saccharate of iron gives denser negatives than sulphate of iron; but it is indisputable that the iron bath, which I have already recommended, and which I recommend anew after having improved it, possesses more valuable properties than that of saccharate of iron. It is of little importance that the picture does not acquire its necessary intensity with a first dose of saccharate of iron as a developer, since nothing is easier than to give it sufficient density. Pyrogallic acid in combination with citric acid, or even sulphate of iron combined with citric acid, furnish intensifiers whose efficacy has long been known. In seeking for a new iron bath, I had no other aim than to obtain upon the negatives all the tones and half tones in the shortest possible time. In this particular, I have to remark that an aqueous solution of cane sugar has given me only such pictures as were deficient in half tones, although they possessed an admirable amount of density. This bath, when old, gives pictures with still more contrast between the parts more or less lighted, while the saccharate of iron was formed naturally by the agency of the bath. The sugar of milk united with sulphate of iron gave me, on the contrary, pictures less dense, but of such perfection in the half tones as left nothing to be desired. I have experimented with baths of iron and sugar of milk of different ages, and the result was that new baths gave much more beautiful pictures than old baths; this was then, in my opinion, sufficient reason for keeping the concentrated solution of sulphate of iron, and that of the sugar of milk, separate until required for use, and then to mix them in sufficient quantity.

Under certain circumstances, there is an inconvenience attendant upon the use of my iron bath. When, from use, the silver bath becomes mixed with a very large quantity of alcohol, the wholly aqueous solution of iron does not flow with the necessary facility over the coat of iodide of silver. My first idea was, naturally, to add a little alcohol to the developing solution. The alcohol, however, destroys in great part the advantageous effect of the sugar of milk, and involves the inconvenience of changing the dose, in proportion to the greater or lesser quantity of alcohol the silver bath contains. It is known that glycerine possesses the property of mixing with the same facility with water and with alcohol, and I have found that it in no respect injures the development of the negative. This difficulty was, therefore, overcome by adding a suitable quantity of glycerine to the bath of iron and sugar of milk

I have also improved my iron bath by adding to it a few drops of an aqueous solution of iodide of potassium, of 10 per 100 strength, which is previously saturated with iodide of silver. An iron bath containing this latter substance will give admirably clear negatives, even when the silver bath and the collodion do not permit of our obtaining unfogged negatives, if we make use of any other kind of developer. It appears that the iodide of potassium and silver convert the iodide of silver, unattacked by light, into an iodide which wholly refuses to combine with the silver set at liberty by development, while the iodide submitted to the influence of light remains intact. When the iodide of potassium and silver has fulfilled its part, it produces an excess of iodide of silver upon the plate, which is easily washed. The photographic picture is feebly revealed before the production of this excess of iodide of silver, and it strengthens afterwards. The formula I now employ for ordinary use is—

Sugar of milk, concentrated solution...	8	volumes
Sulphate of iron	2	"
Glycerine, pure	1	"

Twenty drops of the above mentioned iodide of potassium to three and a half ounces of the mixture of sugar of milk, sulphate of iron, and glycerine.

My experiments with sugar of milk had for their special aim the finding of a wholly neutral iron bath, as I had the conviction that such a bath would give results very superior to acid iron baths. I should remark, however, that the saccharate of iron must be acidulated to avoid the pictures becoming fogged. These experiments have led me to some very remarkable results.

When we make use of a collodion containing only iodides, a neutral iron bath will give pictures very strongly marked in all the tones, and the addition of a bromide to the collodion will have no other effect than to reduce the clearness and intensity of the pictures. The various iodides do not all produce the same effect. Iodide of potassium gives very harsh pictures: the other iodides yield weaker contrasts in the following order:—Iodide of sodium, of calcium, of ammonium, of cadmium, and of lithium. The last iodide gives to the picture a flatness of tone anything but agreeable. In making use of a neutral iron bath, we obtain, with a mixture of iodide of cadmium and iodide of calcium, in proper proportions, a collodion which yields pictures of great perfection. With an acid iron bath, and making use of a simply iodized collodion, it is impossible to obtain well modelled pictures.

I have found that a picture obtained with a neutral iron bath is wholly dissolved in a weak aqueous solution of nitric acid, which does not take place when the picture is developed with an acid developer. The first of these two results proves that the picture formed by light upon the iodide of silver consists of pure silver. This fact is in contradiction with the hypothesis, according to which, light does not decompose the iodide of silver, but exercises upon the latter a purely physical action.

We owe to M. Ommeganck the knowledge of a curious experiment upon the insensibility of the iodide of silver, formed by the aid of the iodide of zinc, produced by galvanism; and upon the efficacy of an iron bath, the sulphate of iron of which is produced by means of the voltaic pile. Dr. Van Monckhoven remarks that the result of this experiment proves the physical theory. I regret to differ from him in this particular, but he will excuse my not renouncing my chemical theory, in presence of what he has himself stated in his *Traite Général de Photographie*, p. 77.

"It (the iodide of silver), on the contrary, blackens very rapidly when it is in presence of an excess of nitrate of silver, unless this nitrate contains nitric acid. This proves that light decomposes iodide of silver into silver and iodine." And at p. 324 of the same work, he further says:—"The action of light upon the iodide of silver of the negative processes is therefore purely physical, and if in some cases a picture is produced by chemical action, it is due not to the iodide of silver, but to the argentico organic matter."

I believe that it is possible to give a plausible explanation of the fact remarked by M. Ommeganck, by adopting the chemical theory. I have found that some substances which have the property of rendering the so-called *insensible* iodide of silver sensible to light, previously added to the collodion, or to the silver bath, injure the sensibility of the film of iodide of silver in a very marked manner. When a certain quantity of congou tea, infused in alchohol, diluted with water, is added to the silver bath, a brownish precipitate of albuminate of silver is formed, while the tannin of the tea does not reduce the nitrate of silver. Such a bath gives films of iodide of silver which are almost insensible slight.

When a current of ozonified air is passed through iodized collodion, this collodion will receive almost no impression from light, and we know that ozone exercises upon insensible iodide of silver an influence similar to that of tannin. The manner of obtaining a film of insensible iodide of silver, consists in causing light to act upon the film, placed in contact with a solution of iodide of potassium, saturated with iodide of silver. If it be not saturated, the iodide of the film is dissolved after some time of contact. It requires therefore the action of light, and that of a certain iodide to change the sensitive iodide of silver into an insensible iodide. The action which tannin exercises upon insensible iodide of silver, in restoring to it its sensibility, is an action analagous to the action of light upon sensitive iodide of silver. It has been already proposed, and if I do not deceive myself, also successfully tried, to give a greater sensibility to plates of iodide of silver, by exposing them for an exceedingly short time to diffused light, before exposure in the camera. The iodide of silver then formed, if we make use of an ozonified collodion, or of a silver bath, containing a certain quantity of tannin from tea, will be exposed to two actions, the one analagous to that of light, and the other to that of iodide of potassium; the result will be that the iodide of silver formed is insensible to light. The collodion prepared as M. Ommeganck prescribes, must be ozonified, and for this reason give an insensible iodide of silver. The preparation of sulphate of iron by means of a galvanic battery will considerably dimish the reducing power of this substance, and then it will give no picture.

It is natural that the insensibility will not be perfect in every case, as it must depend upon the quantity of ozone or of tannin which the collodion or the silver bath contains. In consequence of my experiments on this matter, of which I shall mention a few words in concluding this article, I venture even to say that the insensibility will never be complete.

When we place a plate of sensitive iodide of silver, washed with care, in a dish filled with an aqueous solution of iodide of potassium, strength 10 per 100, previously saturated with iodide of silver, the iodide of silver of the plate then becomes as before stated, insensible to light, at least when we make an intense light act upon this plate, while it was in contact with iodide of potassium. Such a plate, washed and dried in the sun, put into the slide, immediately upon being removed from this intense light, and exposed in the camera, directed to an object illuminated by diffused light, will give a picture of this object. When the dried plate is kept some time in the dark, in contact with atmospheric air, its sensibility is much greater, and if exposed to the influence of ozone, it acquires a very remarkable sensibility.—*Bulletin Belge de la Photographie.*

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THE ICONOMETER.

BY C. OMMEGANCK.

The Iconometer, unfortunately but little known among photographers, and so seldom described in treatises, is a valuable instrument, by means of which we can determine beforehand—or *à priori*, as fine writers say—two very important things.

1. What kind of camera must be employed in a photographic representation to obtain within given dimensions, any object, such as group, picture, or landscape, the distance being given.

2. At what distance the photographer must place himself from an object if he has not at his disposal a selection of cameras, when it is necessary to embrace a given subject within a determined space.

Lastly. This instrument enables the operator to ascertain if what he proposes to do comes well within the limits at his disposal, so as not to betake himself to places with a load of apparatus to find that he has made wrong calculations.

We have purchased several expensive iconometers, but none have answered better than the one we have obtained by means of a double watchmaker's eye-glass.

The iconometer is a camera obscura in miniature, and furnished with an objective; it gives small pictures, and may be employed for taking small photographs. It is furnished with a ground glass, upon which the object to which the instrument is directed is depicted. A series of squares is previously traced upon the ground glass with a lead pencil, which correspond with the several cameras at command.

Whatever presents itself within the limits of one of the traced squares, can be reproduced by the corresponding apparatus, and of the dimensions indicated, which fact will become clearer when we have explained the construction of the instrument, and the determination of its relations with the cameras a photographer may happen to have in his possession

The word *iconometer* is derived from the Greek, and signifies "measurer of pictures." It is constructed in the following manner:—Procure a watchmaker's eye-glass, composed of two plano-convex lenses fixed in a horn mounting. Construct two tubes of cardboard or metal, of about 3 inches in diameter, sliding one within the other, like the tubes of a telescope; the interior tube will be 3 inches in length, the outer 3¼ inches; in the interior tube, we put a bottom at a distance of ¾ of an inch from the extremity; in this bottom, a circular hole is made in which the eye-glass is placed; in the external tube, at 1⅛ inch from its extremity, we also put a bottom in which a circular opening of 2¼ inches diameter is made, before which a ground glass is placed. We thus construct a photographic apparatus of small dimensions—a cylindrical camera obscura—with a draw of 1⅛ to 1⅜ inches.

We proceed in the following manner to mark the squares that serve to indicate the relation between the iconometer and any given camera. The relation between the dimensions of the photographic proofs, as to their length and breadth, is generally as three is to four, if whole plate. We draw upon a wall or, by means of four cords or four laths, describe a proportional rectangle of 72 inches wide and 96 inches high, and place in front of this square a whole-plate camera, and advance or withdraw it until the square in question being focussed upon the ground glass of the above-described apparatus, exactly corresponds with the lines drawn on the ground glass which indicate the dimensions of a whole plate. We then take the iconometer and turn the ground glass outwards, holding it over the box of the apparatus, so that the two ground glasses are at the same distance from the fixed object, and consequently in the same plane; and then adjust the ground glass of the iconometer to the lines of the square towards which it is pointed. It is evident that everything comprised within the small square drawn upon the iconometer is necessarily contained in the larger frame traced upon the ground glass of the whole-plate apparatus, and nothing more; we proceed thus successively with all the cameras we possess. We may recommend for each camera a small separate corresponding ground glass, which we can slide into the iconometer in the same manner as with diaphragms, for the great multiplicity of lines may sometimes lead to error. Upon the ground glass corresponding to the whole plate, we mark the limits of whole plate, half plate, and quarter plate; upon the different glasses corresponding to objectives of larger dimensions, we mark the superior dimensions and the subdivisions of the whole plate. By this method we obtain the advantage of being able to judge in a moment, not only if a given apparatus will contain the subject it is proposed to reproduce, but also, within what limits it may be rigorously kept. We also mark a separate ground glass for the stereoscope, especially if we arrange different systems of lenses for this kind of work. As an aim, we take a large square, the length and breadth of which are in relation with the corresponding dimensions of the stereoscopic pictures.—*Bulletin Belge de la Photographie.*

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CARD PICTURES REPRESENTING THE SAME PERSON IN TWO DIFFERENT POSITIONS ON THE SAME CARD.

BY PROFESSOR TOWLER.*

This mode of taking photographs, that is, of representing the same person in two different positions on the same card, is not new, for we have Daguerreotypes of the same class that were taken fifteen years ago; but to the majority of our readers it is a new process, and one which is kept tenaciously as a great secret by those who practise it. It probably will come into favour, and hence it becomes our pleasant duty to communicate to our subscribers and readers the minutiæ of the process.

Any ordinary background may be used, but it is well to suspend a curtain from the ceiling, so as to hang in deep folds about the middle, in front of the background. The intention of this is, that the line of a dark fold may form the division between the two pictures, or, at any rate, hide the division line. In front of the background may be arranged a variety of accessories, such as a table, bookcase, piano, pillars, balustrade, &c., to suit the occasion.

We will suppose, in the present case, that a lady is represented seated at the piano playing, as one picture, whilst the same lady is represented in conversation with a gentleman near the end of the piano, as the second card picture. (To be represented in conversation at the time the lady is playing, we admit is a very poor compliment to her performance, and beg it to be distinctly understood that we know better than that, and avail ourselves of this opportunity to make a glaring fault in artistic collocation, in order to have an opportunity of condemning the vulgar flippancy and glibness of tongue during the performance of such artists as Gottschalek and Mills.)

Now the means by which such a picture can be fabricated, so as to be completely deceptive, is the following:—

The pictures are taken on the same plate, one after the other, one occupying one half of the plate, whilst the other occupies the rest. The focussing is performed for the two pictures beforehand, so that the model has simply to change his position as soon as the cap is closed.

The slide in the plateholder consists of two plates of zinc, &c., sliding one over the other. In the middle of one there is cut a rectangular opening equal in size to the card picture; the second slide has in the middle two rectangular openings and a space of zinc, &c., intervening somewhat larger than one-half the rectangle in the first slide. The first slide is not moved, whilst the picture is being taken, or focussed. In order to focus, draw out the second slide until the middle zinc space covers up just one-half of the opening of the first slide, leaving the right half uncovered; in this space fix your model in position No. 1. Fix upon a point in the carpet, on the piano and on the curtain in the background exactly on the right edge of the zinc septum. Now draw out the second slide still more until the right half of the rectangular opening in the first slide is covered, whilst the left side is open; if the three points just observed as test points graze exactly on the left edge of the zinc septum, the arrangement of the slides is nearly correct. Fix your model in position No. 2, focus accurately, and arrange matters by means of head rests and other accessories so that the person can change his position from one position to the other with facility and without destroying the sharpness of the picture.

The only difficulty in this picture is to get the second zinc slide into the right position, so that where the first picture ends the second begins; a little practice will soon obtain the right position, or the amount by which the second slide is to be drawn out. Mark this amount accurately by notches on the edge of the zinc slide.

Be very careful not to move the camera whilst the slide is being drawn out, or the cap removed or replaced. Adjust the cap on its place whilst the model moves from one position to the other, and keep it there whilst the second slide is being adjusted.

With careful manipulation you will succeed, and as soon as you do, you will be enabled, if you have any ingenuity or imagination, to compose some very surprising, interesting, and comical pieces of art. You may thus represent the two sides of the picture, or, as the fable has it, of the shield; you may represent some patriarchal individual at home, in all his domestic harshness and crossness, repelling the kindness and meekness of a patient wife on one side, whilst on the other you represent him as a gay Lothario, pleasant and smiling, and smirking with certain loving soft creatures that always regard the society of married men most delectable. Another picture may exhibit on one side a lady *habillee*, and on the other side *deshabillee;* on the one, the full blaze and wide dimensions of fashion and folly; on the other, amidst cosmetics, rouge, powder, puffs, and wadding, sans eyes, sans teeth, sans hoops, sans mammæ, sans cheeks, sans everything. What a scope there is here! What a wide field opens before the yearning art photographer.

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M. AUGUSTE CHEVALIER'S PHOTOGRAPHIC PLANE TABLE.

This apparatus consists essentially of an optical arrangement similar to that adopted by Porta for his *camera obscura,* that is to say, of a combination of prism and lens, so that the images of objects are reflected on a horizontal surface.

The tube containing the optical system is carried by a platform capable of receiving a continuous or discontinuous rotary motion round a vertical axis, exterior to the tube and parallel to the optical axis of the lens, which is itself vertical; besides, the prism is placed in a position exactly perpendicular to the plane passing through the axis of rotation, and the centre of the lens.

We may conceive, then:—

1st. That if a plumb-line be placed in the prolongation of the plane passing through the optical axis and the axis of rotation, its image will appear upon the horizontal plane according to a ray brought from the axis of rotation to the projection of the optical axis upon this plane.

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* From *Humphrey's Journal.*

2nd. If plumb-lines be placed all round the apparatus, and if, without changing the axis of position, we bring this apparatus opposite to each of them, in the position we have defined, that is to say, in such manner that the plumb-line and the two axes are in the same plane, the images which appear upon the horizontal plane will form angles between them exactly like those which the plumb-lines make with each other, and with the station point of the apparatus.

3. If the apparatus be placed in the centre of a landscape, and brought successively opposite to each of the points of this landscape, the angles which will be made between the rays brought from the centre of rotation to the projection of the optical axis will consequently measure the angles made between them and the station point, the points meeting successively in the plane which passes through the axis of rotation and the optical axis. Such is the theory of the apparatus.

The other arrangements adopted are as follows:—The images, instead of being received upon a simple screen of white paper or ground glass, are received upon a surface sensitive to light, such as is usually prepared for photographic purposes.

This surface retains an impression of the images. But the images, whose dimensions vary with the diameter of the lens, and which are modified at every moment in consequence of the movement of rotation, being superimposed upon each other, and the sensitive surface retaining them all, utter confusion would result, if this inconvenience were not remedied by a simple artifice. The whole of the sensitive surface is covered with a screen entirely opaque, in which, however, a very narrow aperture is contrived, the meridian line of which corresponds with the plane passing through the optical axis and the axis of rotation of the apparatus. This aperture allows then only the luminous rays which are in the plane to pass, so that the sensitive surface is impressed by these rays only, and simply retains the image of the point encountered in the plane in question.

It is understood that the screen is carried by the platform in the rotary movement. This arrangement permits of the application of continuous motion, and when the apparatus has made a complete continuous revolution, the sensitive surface indicates, exactly and materially, the angles made between them and the station point at all the points of the horizon, which are successively presented to the optical field of the apparatus. The apparatus is therefore a true *photographic graphometer*.

When an operation has been made at one station, we can make a second operation at another station; if from this second station we can see all the points which were seen at the first, and knowing the distance between the two stations, we have all the elements either for calculating or graphically determining the exact position of all the various points.[*]

In most cases it is not necessary to have the position of all the objects comprised in a continuous turn of the horizon. It is sufficient to have a certain number of them, and the apparatus is arranged, as we have stated, to effect a discontinuous movement, so that the optical axis comes to be placed opposite the objects whose position we wish to obtain, and which is viewed by means of a telescope placed in the plane passing through the optical axis and the axis of rotation. In this case, the shape of the diaphragm is modified, and the position of the optical axis is indicated by means of a hair arranged for that purpose.

Moreover, a second hair, which subsists even when operating by continuous rotation, is placed perpendicularly to the plane passing through the axis of rotation and the optical axis, so as to intersect this latter axis. Now, as for every operation, the apparatus must be placed in such a position that the optical axis and the axis of rotation are vertical, and the sensitive surface horizontal, the hair intercepts the image at all the points which come within the horizontal plane corresponding to the optical axis, and thus gives a real picture of this virtual plane upon the plate.

In what has been said above, we have supposed the apparatus turning upon an axis; but it is clear that without changing anything in the other arrangements, we can render its axis of rotation horizontal by placing the sensitive surface vertically. In this position, the apparatus gives the relations of the real angular positions, the same as in its primitive position; it gives the angular relations of the vertical lines, as it can serve to determine the angular heights above the horizon from different points placed opposite to it.

Consequently, if by means of two operations made with the apparatus, the sensitive surface being horizontal, we determine the distances of the different points from the station-point, either graphically or by calculation, it will be easy, by making a third operation at one of the two station-points, the sensitive surface being placed vertically, to determine the altitude of the points, the position of which has been given by the first two operations.

Among the important services this apparatus can render, we may remark, first, that it suppresses all error in reading off the angles, which so frequently occur when employing the repeating circle, theodolite or graphometer; and that in the case where by any possibility an error of this kind may be committed, it is always easy to correct it without going over the ground again, since we have in our libraries the exact material and mathematically correct representation of the scene, with all the natural or artificial data which may occur in the optical field of the apparatus.

Some experiments, made in 1861 and 1862, by officers of the division of engineers in the Imperial Guard, gave very satisfactory results. General Morin recently presented to the Academy of Sciences, at Paris, specimens of the results obtained in this application of photography, by Captain Javary. The views and plan were those of the city of Grenoble and its environs, taken by means of two objectives of different focal distances, 20 inches and 10¾ inches. The first objective was employed to obtain images of distant objects sufficiently large to admit of all the details being carefully studied. The second objective, which had the advantage of presenting a clear field of 60 degrees, was reserved for views of near objects.

The total extent of the ground represented upon the map exceeds 20 square kilometres. The map is on a scale of $\frac{1}{5000}$, and the numerous details it contains have been *entirely* deduced from twenty-nine views taken from eighteen different stations. The horizontal stations are drawn at equal distances of 10 mètres. The operations on the ground occupied sixty hours. The results were forwarded to Paris, and there studied and reduced, in the short space of two months. By the old methods, several weeks, or even months labour on the ground would have been required.

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ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.[*]

AQUA-TINTA, a process of engraving which was extensively used at the beginning of the present century, but which is now rarely employed, was executed by a process of the following description:—The surface of the plate of metal to be engraved was equally covered with a finely powdered resin. The plate was then warmed, to attach the grains to the surface of the metal. A tracing of the design to be engraved was laid upon the resin, and the surface of the plate, after the whites had been stopped out, was submitted to the corroding action of acid, which, acting between the grains of resin, produced a granulation in the face of the metal plate. The light parts of the design were next stopped out, when the acid corrosion had been carried far enough. The darker parts of the design were again submitted to the action of acid, and this process was repeated till all the gradations from light to shadow, required by the design, were produced in the metal. A slight amount of burnishing and scraping of the plate, so bitten in was then resorted to, to blend the several parts of the picture, and to heighten the lights where necessary. This process was carried to great perfection by Mr. Saudby, about 1799. Such were the various processes in general use at the beginning of the present century, the whole being originally executed in copper. A growing demand for book illustrations, and a necessity for producing the engraving in a more durable metal, and one that would consequently yield a greater number of impressions, led to the introduction of the next process.

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[*] A triangle is determined when we know its base and its two adjacent angles.

[*] Continued from page 56.

Steel and Machine Engraving.—The invention of steel engraving is due to Mr. Perkins, who first introduced the art in America; his object being to increase the facility, cheapen the cost, and produce absolute identity in the manufacture of bank notes. In order to effect this, he etched or engraved a steel plate, or, more properly, a block of soft steel, by the ordinary process of line engraving. The plate or block was then hardened. A cylinder of very soft steel, of from two to three inches in diameter, was then rolled backwards and forwards under pressure on the surface of the steel plate, until an impression from the engraving was obtained in relief on the face of the cylinder. The cylinder so obtained was in its turn case-hardened, and by rolling the hardened die over the surface of a flat plate of copper or soft steel, an exact copy of the original engraved plate, with all its sharpness, was secured. This process being repeated, any desired number of plates could be obtained from the die. As the object first sought was the production of bank notes, and the cost of elaborate designs was great, a machine was invented in America by Mr. Asa Spencer, which was called a geometric lathe, and this was employed in the production of geometrical figures in combination with line engravings, as borders and ornaments on the face and back of notes. Mr. Perkins brought his invention to this country, where it was introduced and known as the "sederographic" process for multiplying copies of engravings. Soon after his arrival in this country he was joined in working his process by Mr. Heath, and they state, in 1821, "we cannot yet say how long a well hardened steel plate will last, having never printed more than 500,000 impressions from the same plate. It should, however, be observed that this plate consisted principally of writing, or work quite as strong. It may also be observed that the impressions are yet good." The first steel plate engraved in this country is attributed to Mr. Raimbach, who was soon afterwards followed by the Chairman of the Fine Arts Committee of the Society of Arts, Mr. Charles Warren. Engraving on steel, beyond necessitating a change in the nature of the acids used, and a better and more perfect graver, involved but little alteration in the process of engraving itself. Steel plates yielded a much larger number of impressions, but they also demanded more time in their execution, and, as a consequence, a higher rate of remuneration for their production; and thence arose a class of men whose works as artists gave fashion to the art of engraving and book illustration; and out of their labours came such works as "The Forget-me-not," "The Keepsake," "The Book of Beauties," &c. &c., coupled with which works are the names of the Findens, Charles Heath, Rolls, Lacy, the Le Keuxs, Goodall, Wilmore, Doo, and others, a school of engravers which has now entirely passed away. With the extended use of steel, however, came a proportionately heavy charge for printing, which, where large numbers were required, it was desirable to reduce as far as possible. This charge was not material as affecting high-priced works, but a considerable demand for illustrated books having arisen, a readier and cheaper means of illustration was required; we accordingly find that "Hone's Every-day Book" and "The Penny Magazine," which were popular works, and amongst the earliest examples of cheap literature, were illustrated with wood engravings, which, being produced in relief, and capable of being printed with the type, saved the ordinary extra charge due to printing from steel plates. But, however artistic and effective wood blocks were, they lacked the refinement of the steel engraving. Concurrently with this spread of art in England, came the opening of the American, and the creation of an Australian market for English literature, and the adoption of a German discovery, which has done more to revolutionise art in this country than any other previously introduced, viz., the invention of lithography by Alois Senefelder, who, about 1795, while in search of a cheap means of printing the pieces which, as a dramatist, he produced, by an accident discovered that by writing on a slab of Kelheim stone, with ink prepared with wax, soap, and lamp-black, and then biting in the stone with *aqua fortis*, a surface in relief could be obtained, from which prints could be taken almost as easily as from wood blocks. This discovery led to the art of lithography as now practised. To the growth of the lithographic art I shall return hereafter, but for the present I would merely say that its introduction, and the great cost, as well as the time involved in printing from steel or copper plates, led to numerous attempts to cheapen the cost of engraved plates, and also to multiply the plates when produced. The process introduced by Mr. Perkins was inapplicable to large surfaces, both on account of cost, and the difficulty and risk of injury in applying it. But machinery had been applied in the form of the geometric lathe, and a desire was created to possess a machine of a simpler character, which might be employed to produce skies and backgrounds in architectural subjects, as well as backgrounds to portraits, without involving the skilled, and in many cases monotonous labour of etching. This want was soon supplied by Mr. Lowry, who was speedily followed by Mr. Porter, Mr. Taylor, Mr. Storker, and others. By the first-named a machine was invented for ruling either straight or waved lines, which lines, when used separately produced flat or graduated tints, and when used in combination produced the effect now so generally seen on the face of banker's cheques. Mr. Taylor's machine consisted of a square bed, on which the plate to be ruled or engraved was laid, and over which a second bed was slidden or thrust. This bed was held in position by means of springs, which pressed against the inner side of a frame, over, and attached to the upper and lower edges of the square bed of the machine. At the back or right-hand side of the machine, was a solid block, to which was attached on its centre, a female screw, in which worked a clamping screw. The motion of the machine was produced as follows:—A bar of iron, having at one end a pin fitted into a socket on the sliding bed, while its other end passed through a slot below the female screw plate on the back of the machine, and a clamping screw being brought down upon this bar, prevented the sliding bed being moved from its position until it was thrust forward by an index lever, placed at right angles to and connected with the iron bar. The degree of motion of the bed was then regulated by the distance through which the index lever was thrust, and this was determined by means of a screw stop. Mr. Storker's machine had for its bed an inclined plane, over which worked a second wedge-shaped bed, and the tint was ruled by gradually removing the thick end of the wedge from the centre or edge of the machine. In both cases after motion had been given, to regulate the width of the lines to be ruled, a carriage, carrying a diamond point, was caused to travel above the face of the plate to be ruled, and the diamond being allowed to drop on it, the line was drawn or etched. By substituting for the straight line in which the carriage travelled, any required character of etched line, and causing the carriage carrying the diamond point to travel in it, a corresponding motion was communicated to the diamond, and the desired effect was thus mechanically obtained. But where lines were required to be ruled in perspective, the plate was fixed on a bed which revolved on a centre. The use of these and other similar machines was soon largely resorted to, and ultimately line engraving, as a commercial production, deteriorated; and in its place grew up a mere vulgar effect of light and shadow, the combined result of a set of lines ruled over the entire surface of a steel plate, and then acted upon by acid, as in the case of aquatint engraving. There were, however, other forms of machine engraving introduced, which have given rise to new industries, and continue still in use, such as the medallion engravings executed by Mr. Bacon's machines, in which a medal or modelled design was employed, and over the medal a tracer was made to travel, which varied in its direction from a straight to a curved line, in proportion as the surface was either flat or in relief. The background of the medal was represented in the engraving by a flat tint, while the high lights of the medal were produced by a widening of the lines, and the shadows by a comparative contraction of them. Modified forms of this machine are still in use, and have been applied to engrave rollers for printing calico and other fabrics. The result of these machine processes, coupled with the introduction of lithography, was to create serious competitors with the aquatint and mezzotint processes, which may be said to have been swept away by the great advance which lithography has made, to the consideration of which we will now return.

(To be continued.)

Proceedings of Societies.

The London Photographic Society.

The Annual Meeting of this Society was held on the evening of Tuesday, February 7th, the Lord Chief Baron in the chair.

The minutes of a previous meeting having been read and confirmed Mr. T. Greenish, Mr. Hollyer, and Mr. J. B. Nicholas were elected members of the Society.

A number of charming reproductions, from paintings, by Mr. Thurston Thompson, were laid on the table. An apparatus for reducing residues was exhibited by Mr. Solomon, and some fine examples of photography on opal glass by Messrs. Holsby and Co.

At the request of the Chairman, Dr. Wright read the annual report of the Council, from which it appeared that the expenses of the Society exceeded the income during the year by £66 4s. 10d. This excess was due to the loss on the exhibition, which exceeded £100. The report proceeded to an analysis of the expenses and income of various preceding years, showing the loss arising from its exhibitions, and intimating that, although a short exhibition of some kind would be desirable, the Society would not be justified in incurring at present the risk of another exhibition similar to those held on former occasions. The amount at present owing by members in arrears was nearly £200. We shall give the report *in extenso* in our next.

The report having been adopted

Mr. **Elphinstone Underwood** proposed in accordance with a recommendation of the report that the days of meeting be changed from the first to the second Tuesday in the month, in order that their proceedings might appear in the next *Journal* without the intervention of such a long interval as at present.

Mr. **Spode** seconded the resolution, which was carried.

The **Secretary** read a letter from Dr. Hermann Vogel, calling attention to the forthcoming Photographic Exhibition to be held in Berlin.

The **Chairman** said this was the annual meeting at which officers were elected; but according to the laws of the Society any suggested change in what might be called the house list should have been made at an earlier meeting. Whether from complete satisfaction with the names nominated by the Council, or from some other reason, no other names had been proposed, and there would be no necessity to proceed to election or to appoint scrutineers. He had only to declare the names of the gentlemen now elected or re-elected as officers. Himself (the Lord Chief Baron), as President; Dr. H. G. Wright, as Vice-President; as Treasurer, A. R. Hamilton; as Members of Council, Mr. H. P. Robinson, Mr. Thurston Thompson, Major Gresley, Mr. Mayall, and Mr. Shadbolt. For his own election he thanked them. He entertained the same zeal for the progress of photography, whether as an art or a science as he had ever done. Although he was not so young now, nor so able perhaps actively to illustrate that zeal, still he was capable of rendering them some service, and he hoped to save them some expense in a place for meeting. It was notorious that other societies with no higher claims to the assistance of Government were provided with rooms at Burlington House. Almost every society with any claim whatever had rooms there. He purposed going there himself next day to ascertain how far, in point of fact, accommodation could be secured for this Society; and if he found that a suitable room was to be had, he would make application to the members of Government, with whom the matter rested, and obtain sanction for this Society to be accommodated. The Chairman then proceeded to remark upon the value of photography in scientific discovery, especially in relation to astronomy, and expressed a hope that an address on that subject would shortly be delivered to the Society by Mr. Warren De La Rue. He referred to the fact that photography had aided in discovering facts in relation to the physical condition of the sun which the human eye had not been able to perceive. There were invisible heating rays at the end of the spectrum beyond the red, and invisible rays at the other end beyond violet. These latter were able to impress on the photographic plate objects invisible to the eye or rather to the human eye. Possibly there were other eyes able to see these rays. The human ear became, under some circumstances, deaf to certain sounds, like the chirp of the cricket and the shriek of the bat; and, in like manner, the human eye might be blind to certain rays perceptible by other eyes. Photography had, however, rendered visible certain facts in relation to the surface of the sun which had before been unknown. In like manner, it had thrown light on chemical science, and he looked forward with interest to still further discoveries by its aid. He again thanked them, and would have pleasure in serving them as long as he could be useful; and when he ceased to be their President, he would not cease to be their most zealous well-wisher and promoter of their interests.

The meeting then adjourned.

Correspondence.

FOREIGN SCIENCE.

[from our special correspondent.]

Paris, 7th Feb., 1865.

We have heard so little of the waxed-paper process of late, that it was both a surprise and a pleasure to see it introduced to the notice of the members of our Photographic Society at their last meeting. M. Civiale exhibited some very beautiful negatives, taken, we understood, upon paper prepared with a mixture of four parts of paraffin and one part of white wax; when dried the paper is iodized in a solution of

Iodide of potassium	36 grains
Bromide of potassium	3½ „
Alcohol c. 38°	1 quart.

The iodizing is effected in vacuo. The time of exposure varies from 9 to 12 minutes for proofs measuring 10¾ by 14¾ inches.

The public lectures on scientific subjects, established last winter at the Sorbonne, have been regarded as one of the happiest efforts of the Minister of Public Education. Their popularity has been immense: the hall crowded to overflowing with most refined and fashionable audiences, and rivalling the opera in attraction. Among the subjects recently announced, and from which much was expected, was a lecture on photography, by M. Fernet, certainly a more attractive subject could not be presented, and full justice was demanded and expected from the lecturer. I regret to say that the lecturer took a very narrow view of his subject. He limited himself to an explanation of the fundamental principles of photography, barely alluding to the numerous ingenious applications made of it to science and art, to astronomy, engraving on metal and on stone, to sculpture, and to electro-metallurgy. He may, however, excuse himself on the plea that each of these subjects would demand a lecture of itself; but even in a summary lecture it would have been agreeable and interesting to have had a complete, though brief, account of the progressive applications of one of the greatest and most fruitful discoveries of the present century. Not even the names of the great founders of the art were mentioned—Daguerre, Niepce, Herschell, Talbot, all were passed over in silence. Even the experiment of printing by the aid of the magnesium light failed from some fortuitous circumstance. If the audience obtain no more favourable view of photography than that afforded by this lecture, our art must suffer greatly in their estimation.

The magnesium light has been in great demand lately, for the sun has, during the past few weeks, scarcely deigned to shine upon our operations. Everything conspires to indicate that the future of this new illuminator will be great.

It is announced that the International Photographic Exhibition, at Berlin, will be opened on the 15th of May next. Every thing appertaining to the photographic art will be admitted; the 10th of April is the last day upon which articles will be received.

LIME TONING BATHS.

Sir,—Will you permit me to state, in reply to Mr. Reeves, that the advantage of a bath containing a certain amount of chloride of calcium over one in the free acid of the chloride of gold is simply neutralized, is that the colour of the print, is much more under control; the toning goes on slower. The variety of tints, through which the proof passes, is much greater before it reaches the black. Of course, if a very acid chloride of gold be used, a considerable quantity of chloride of calcium is made before it becomes neutral, in which case it approaches the chloride of calcium bath. I spoke of a neutral chloride of gold, or what is known as such, because more certainty of composition can be thus attained with respect to the change, Mr. Reeves speaks of, if the prints are left too long in the bath, as he does not mention what that change is, I cannot say if it takes place or not. If he means a bleaching effect, as is often the case with the chloride of lime bath, I have never found anything of the kind: the prints lose brilliancy, but nothing more.—I remain your obedient servant,

7th Feb., 1865. Charles Heisch.

PHOTOGRAPHERS' FIELD CLUB.

Sir,—The pleasure which has attended the out-door meetings of the South London Photographic Society, and the success which has attended similar meetings of other societies, has suggested to me the desirability of some efforts being made by amateur photographers to form societies or clubs, similar in character, and having the same objects in view, as the sketching clubs of amateur water colour painters, and others.

The opportunities which such associations or clubs would afford for comparing results, the incentives to exertion and improvement, combined with many other advantages which readily suggest themselves, have induced me to trespasss upon your space.

If any of your readers, amateurs, like to try the experiment (being resident in London or the suburbs), I shall be glad if they will communicate with me, so as, if possible, to make the necessary arrangements to begin this spring.—Yours respectfully, Frank Howard.

10, *Lansdowne Road North, South Lambeth.*

PANORAMIC PHOTOGRAPHS.

Sir,—In the "Echoes of the Month," in the last number of the News, the writer puts words into my mouth which I did not say, and omits what I did say, in reference to Mr Johnson's camera at the last meeting of the Photographic Society. What I said was this:—That the discussion of its merits involved the distinction between plane (not plain as printed)* perspective, and panoramic perspective, the principles of which were strictly mathematical. I feared that, however interesting such a discussion might be to a few, it could scarcely be made attractive to a general audience. Whilst I admitted and admired the mechanical ingenuity displayed in the construction of the camera, I hope it would not go forth to the world from the Photographic Society,—that the pictures produced by it on the plane surface were either artistic in character, or true in representation.—I am, Sir, your obedient servant,

7th Feb., 1865. P. Le Neve Foster.

KEEPING TANNIN PLATES.

Sir,—A question having arisen respecting the keeping qualities of tannin plates, induces me to give you my experience as an amateur photographer.

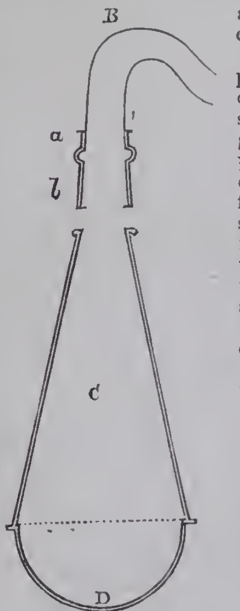
I coat my plates with a gelatine (Bell's preparation) solution, made after a formula as given by Major Russell in the last edition of his "Tannin Process." My bath is slightly acid with acetic acid; the plates are well washed (when taken out) with distilled water, and then put into a bath of common water for two or three hours; when taken out, they are rinsed with distilled water, and a 15-grain tannin solution, an eighth part of alcohol, is thoroughly applied, and they are set up to dry.

Plates so prepared I have kept for nearly twelve months without the slightest loss of sensitiveness, and I have kept them a month after exposing before developing without harm. Some I kept ten weeks after exposing, and even then I obtained a negative that I think I shall be able to print from; but I was much pressed for time in developing, and my room and chemicals were very cold, or I think I should have obtained a much better negative. This was with ordinary pyro and acid silver developer; but I hope to try the developing question more fully and satisfactorily next summer. In wetting the plate before developing, I dip it quickly into a dish of distilled water, as I find that if I level the plate, and flow the water over it, that a mark is formed in the finished negative, wherever the water at any part ceases to flow, if only for an instant, can you tell me the cause of this? I expose from three to five minutes according to circumstances.—I am, sir, yours truly,

Watford, February 7th, 1865. E. E. D.

MANUFACTURE OF OXYGEN.

Dear Sir,—In conjunction with your correspondent "Thankful," allow me to express my thanks for your courtesy in giving such publicity to the hitherto ill-defined manipulation involved in the manufacture of oxygen gas, the production of which ought to be as safe and certain as any other operation of practical chemistry.



For the information of your correspondent, I beg to remind him, that the compound, chlorate of potash, is constituted as follows:—KO, Cl O_5, and gives up *all* its oxygen, viz., six atoms practically. However, ten ounces of chlorate will fill a bag of three cubic feet capacity; and the quantity of sand to be added depends on the rapidity of action desired: the higher the proportion of sand, the more violent is the evolution of the gas, and *vice versa*. The proportion I generally use is somewhat less of clean dry sand than an equal part.

I also send you a sectional drawing of a safety retort, which (combined with the expanding apparatus figured in the News of January 20th) combines all the elements of safety with efficiency. The bottom, D, is made of copper; the body, C, of thick sheet-iron; the junction of the metal pipe, B, is effected by a short and stout piece of india-rubber tubing, *a*, *b*, which gives way at once on the slightest over-pressure, and is, at the same time, perfectly air-tight. For both retorts I use a common kitchen fire at its ordinary temperature. The safety retort I sometimes use on a retort stand, with a Bunsen's burner of one or more jets.—I am, dear sir, your most obedient servant, Peter Henderson.

3, *Park Hill, Clapham. Jan. 30th.*

COPYRIGHT IN ENGRAVINGS.

Sir,—The importance of the subject must plead my excuse for intruding again on your space, and your own pages so singularly confirm what I have advanced in many instances that I hope you will not consider me tedious in referring to two or three other points in yours and "Detector's" remarks. It is not my intention to seek to depreciate photography, as I consider that with certain objects, and the human face and figure under certain conditions, it possesses powers of reproduction which are unapproachable ; and fine examples of photography, as with other branches of art, will always command admiration, but where the artist, by a few touches produces an evanescent expression of his sitter which he has treasured in his brain, the photographer will waste dozens of negatives in attempting the same, and will never succeed. That it will reproduce a picture equal to a Morghen, a Cousins, or any other skilful engraver, I certainly deny, and I consider "Detector," a very unreliable censor when he seeks to depreciate the engraver's art as he does, and I may quote as particularly pertinent, some remarks of the able editor of the *Art-Student*, in November last, on some processes by M. Dulos, and in reference to the interference of photography with line engraving, who says, "We do not share that apprehension : for as long as true lovers of the art exist, the work of the burin will always possess a charm which no other art or appliance can supply. The engraver who possesses a true genius for his art, takes a high rank among artists ; for to translate the canvas radiant with colours, demands a perfect mastery of the most important element of the graphic art,—chiaroscuro. In accuracy of drawing, in the distribution of light and shade, the engraver, still faithful to his original, may impart to his copy a brilliancy, and purity, and delicacy, which may be sought for in vain in the picture. The "touch," the "handling," and other technicalities of the painter's art, are no less the property of the engraver. The art may lie under a cloud for a time, "but there will certainly be a reaction before long, and we hope it will not find the engravers unprepared to meet it." You say copyright has no existence at common law, but it is nevertheless recognised by statute, in common with many other important industrial interests in the country, such as patents, registration protections, and trade marks, and we know how jealously our law courts and juries will protect those who enjoy such rights against any *proved* infractions on their property, but I cannot comprehend that any doubt should exist in your mind as to the *moral right* in such property belonging to the inventor and painter of any picture in the first instance, and consequently to his assignee, the purchaser of such copyright, viz., the publisher, who has to rely on the sale of the engraving therefrom for his outlay. That the legislature recognizes such moral right is clear, from the protection it affords by statute, upon complying with certain conditions ; and in your reply to J. H. Moric, in "Correspondents," you evince your desire to show that you are entitled to the moral right of first propounding the process of printing with chloride of silver in collodion, and which no doubt you might have converted into a legal right by proper application under the statute ; but if the publishers have sacrificed their legal rights, they cannot by any logic be said to have forfeited their moral rights. "Detector," complains of the raids of the Printsellers' Association against "spinsters" and "widows," but if people meddle with things of which they are ignorant, and when warned of their illegal character, refuse to give up the source whence they have been led astray, they must not complain if they have to bear the pains and penalties incurred. The print publishers, I am sure, have no desire to press hard upon those who ignorantly infringe the law, but with those who produce them the case is different, and how our judges are likely to view such cases, may be gathered from some remarks at the Middlesex Sessions recently, on a pawnbroker, who made a virtue of having given information which led to the property being traced, so that if a trader without a knowledge or suspicion of wrong, falls into an error, he is bound to do his utmost to support the law as it exists.

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* A Printer's error, clearly.—Ed.

You charge the print publishers with having arrayed themselves against the photographic art ; if true, the reason why, is asked. Putting aside the early Daguerreotypes, calotypes, &c., and coming down to near the present time, how few of the productions, out of the many thousands issued year after year, can be dignified with the name of art ! and the wretched exhibitions, which you may see as you walk along the streets and suburbs of London, are enough to make anyone with taste shudder. Can you wonder, therefore, that men thoroughly conversant with the works of artists, illustrious by their genius, should view such productions with disfavour ? And looking at the various classes of society who have adopted photography, could you expect art from those who had had no such education, and, in many instances, were totally ignorant of any of its principles ? But it is gratifying to feel that such a state of things is gradually being remedied, as your pages abundantly prove. Photography, however, if it did not interest the print publisher, did not affect him at first, and now only concerns him in supplanting him in a small source of profit by the undertaking of private portraits (which is truly more the engraver's and printer's loss), and in affording a cheap means of pirating his publications. "Detector" points out the anomally of 650 artist's proofs of "Eastward Ho !" to but 606 ordinary prints ; is he *wilfully* blind, that 650 represents a number which cannot be increased ; but that the plate will yield 6006 ordinary prints, and still more while it lasts ? and it is from the circumstance that the demand for the proofs sold at Messrs. Christie and Manson having exceeded the number printed has caused such advance in price, of which many examples may be quoted. But "Bolton Abbey," *with the publication line*, fetches more than those prints issued without any, simply because no earlier condition of that plate is known.

Last week's News contains a report of the case "Lloyds *v.* Ashfords," and a very jubilant letter from "Detector" with regard to a declaration from the Vice-Chancellor ; whatever value that may have, let him at any rate wait till this particular case is decided. While granting, however, that in printing "artist's proofs" to the extent admitted, the print publishers have abused a practice of small importance at first, but which offered great temptation to increase their returns ; it surely cannot be said that in following a custom from the time of Hogarth, that they wilfully and knowingly parted with their protection to valuable property, as they have recently complied with all the requirements of the statute as contended by the copyists they ought to do, but that does not protect their recent publications from unprincipled piracy. Now, it cannot be urged in favour of those engaged in these transactions that they are ignorant of the fact that large sums are paid for the right to engrave certain pictures, the engravings are also of great cost, and the claim of "Detector" to respectability on the part of those photographers engaged in copying prints indiscriminately, shows a very loose idea of *meum and tuum ;* it may be all very well to raise the cry for good and cheap art for the public, when the photographer possesses a power of reproducing for a few shillings that which has cost the print-publisher hundreds of pounds ; but I say it advisedly, when I say that is a mere cloak to cover that which they well know is illegal, and, in certain cases, they will only dispose of their piracies to those whom they think *safe people.* Mr. W. Warwick King, in the paper published in No. 330, quotes Mr. Ruskin on the importance and profit of studying the old masters ; but he addresses students, and only a cultivated taste can appreciate them, the interest of the general public in *those old-fashioned things* is very slight ; and however well urged by Mr. King, the public will prefer "such wretched specimens of art as 'Frith's Derby Day,'" appealing, as it does, so much more to their national feelings than any old master ; and by the report of the meeting of the North London Photographic Society, in this week's News, Mr. King, on again airing his hobby "Albert Durer," elicited a reply from a practical man, Mr. S. Highley, which is worth noting, that "unfortunately such subjects were least popular, and sold least." This question, sir, is unfortunately narrowed into a very acrimonious quarrel between print publishers and photographers ; let, us, however, examine it in a little wider view, and let us see what other parties are interested in its issue : the public, on the one side, whom you urge, call for cheap art ; and on the other, those who are expected to supply such demand, the painters and the engravers, and with the knowledge you possess how can you reconcile these parties ? The painter is, of course, the source whence modern art flows. Now take your Landseers, your Faeds, your Friths, and other leading artists, do you get cheap art from them ? if you fancy so, go to Messrs. Christie and Manson, in the season, or to the artists' studios, and you will soon be undeceived ; you will find that they paint for wealthy patrons, not for the public. *who may admire, but do not pay ;* the engraver comes next, his patron is generally the print publisher, but he does not engrave fine plates for the sake of the public ; canvas these bodies and hear what they will tell you about copyrights ; ask the Editor of the *Art-Student* his opinion ; ask any artist friends, I expect you will find little comfort in support of your views ; but you urge that photography will give you cheap art, and that it ought to be employed. The print publisher who forms the link between the artists and the public, does not admit that, and with any knowledge of the exigencies of the trade, *you* would acknowledge a doubt on your proposition, but the *copyist* (we must not use a harsher term now) cannot do without the publisher's engraving, and because he demurs to such an appropriation of his property, he is to be well abused and held up as a horrible monster, who seeks his own inordinate profit at the expense of the poor suffering public, longing to get cheap art. Pray, sir, think this matter over again, and do not join in an outcry which is merely meant to conceal very dishonest proceedings on the part of very unscrupulous people; depend upon it photography has many appliances in which its beauty and usefulness can be displayed without having any connection with practices, which, to say the least of them, are very questionable.—I am, sir, your obedient servant, J. S. W.

Sir,—It appears to me that although many arguments, "pro and con," have hitherto been put forward by the contending parties,—print publishers on one side, and photographers on the other—the real point at issue has not been touched upon yet.

To explain myself more clearly, I will simply ask a question:—Does any one, accidentally picking up a purse with money in it, feel justified in spending the money for his own purpose, without making any inquiry as to the ownership of the purse? If so, a photographer, becoming accidentally possessed of a print bearing no name of publisher on it, may, with impunity, appropriate the value in the composition of the print, and set to make money by selling copies made by himself, or from his order.

It is a bad action in either case, and the gross immorality it evinces can scarcely be palliated on the plea of ignorance of a wrong being inflicted upon an unknown individual. But in the case of the man who copies a print or a photograph, it is even worse. And how often photographers have copied works bearing the name and address of the original publishers, I need not state here; a score of prosecutions before the police courts will sufficiently establish the fact.

To suppose for a moment that there is no property in a print, whether it bears or not the name of a publisher, is simply absurd; for, surely, some one must have been at the expense of having the engraving, or photograph, executed. And is it consonant with common justice or equity, that for the purpose of easy gain, any one may be allowed to cast wholesale for popular subjects—to copy and publish to the great injury of the original producer of the work?

I am induced to send you these few remarks in the hope that the subject may receive, from some able hand, all the attention it deserves. And I trust to see, some day or other, the matter properly settled upon a legal as well as moral basis.—Believe me, * *

Photographic Notes and Queries.

Waterproof Colouring.

Sir,—An announcement having appeared in last week's Photographic News respecting the waterproof colouring of photographs, I would beg to observe, your readers may save the expense for instruction by using Jacobson's aniline colours, which can never be removed when once applied, and at the same time give to the photograph an unequalled transparent softness. The colours also remain permanent when exposed to the light. I beg to enclose to you three cards coloured in this new style.

No. 1 is made waterproof, which is done by rubbing the painted picture with a solution of wax and ether.

No. 2, glazed after painting, has the appearance of a photograph in natural colours, there being no pencil touches perceptible. The finest details of the photograph being preserved.

No. 3 is a specimen of tinting with the permanent aniline colours.

Further particulars about these colours shall shortly appear in your columns, if you deem my remarks worthy of your attention.

I shall be happy to communicate with any of your readers, who may feel interested in this new style of colouring, and who may wish to inspect specimens.—I remain, sir, yours respectfully, D. Fruwirth.

[The specimens enclosed are very good. We shall shortly have an article on the use of dry colours and rendering them waterproof after M. Mansion's method.—Ed.]

Talk in the Studio.

Chloride in Collodion.—At a recent meeting of the Philadelphia Photographic Society, Mr. Wenderoth mentioned that he had recently used collodion in printing. He said:—"He had sensitized plain collodion with a salt of zinc, had coated paper with this, then floated on a silver solution and printed. There was considerable vigour in the prints, but he had not been able to tone them to any agreeable colour, nor had he produced a satisfactory surface with the collodion alone. He presumed that some preliminary coating would be needed." In our process of using the sensitive salt formed in the collodion itself, without the use of a nitrate bath, we are able to produce any amount of surface and any quality of tone. Coating paper with salted collodion, and exciting on a silver bath, is not new. Mr. Beattie, of Clifton, says:—"Some five years ago, I made some portraits upon opal glass, by saturating collodion, with the muriate of ammonia, coating the glass with it, when set; sensitizing upon a 40-grain bath, printing in the usual way. I found however, they required a very strong negative, and much over-printing, but with these conditions, I got beautiful pictures. I met the Dean of Bristol, the other day, who then got one of them; he told me he "*thought*" it was a little fainter. I likewise sent a specimen of them to Mr. Mauder, of Birmingham, and there the matter ended, until I began to study the various plans now suggested of using collodion on paper, the Wothlytype, and your own, I think important method. I then prepared some collodion with the salt above named,—set it aside to deposit any excess of the salt,—poured off the clear collodion, and coated paper with it, sensitised some on a 10-grain bath—some on baths up to 40 grains. I inclose an impression upon 10 grains, and one upon 40 grains. I toned them in your bath of sulphocyanide of ammonium and gold; but it gives blue tones. The experiments have been with me of an extemporaneous character. You will see, however, there are all the essentials of good pictures—that is to say, depth or vigour, with fine grave tone. It will be difficult to get a simpler and cleaner method of making pictures. I forget whether it was some gentleman or one of the journals that suggested the idea to me. I inclose a common albumen card toned in your bath."

Copper in Nitrate of Silver.—Mr. Carbutt, a skilful photographer of Chicago, whose acquaintance we had the pleasure of making when he was, a year or two ago, in this country, relates, in a letter to the Philadelphia Photographic Society, a singular experience of the injurious effect of nitrate of copper in the silver bath. We remember Mr. Hannaford once describing a similar experience. Mr. Carbutt says:—"A short time ago I experienced a most curious chemical effect. Having purchased one hundred Spanish silver dollars to make into nitrate, I made part of them up, but did not remove quite all the nitrate of copper, as I had seen it stated that it did no harm in a negative bath, and supposed it admissible for silver solution for albumen paper, so prepared silvering solution out of it. Just at this time I commenced on a new barrel of hypo soda. The prints made on the above solution looked remarkably good all through the toning, except that I noticed they bleached a little more than usual, but when put into the fixing solution, in five minutes' time they were so bleached as to be entirely ruined. I, of course, attributed it to the new hypo, as being too alkaline. Next I procured some hypo of a dealer, and to my surprise the prints acted as on the previous evening; so now I concluded it might be in the silver. On the next day, I made new silver solution of pure silver and nitrate of soda, but silvered a piece of paper on the solution containing nitrate of copper, when ready for toning. All went well up to this part; I then fixed some from each silver solution in the two fixing baths, to fully satisfy myself that it was not the hypo soda, and the result was, that the paper, silvered with the nitrate of copper in solution, bleached in either fixing bath. I then further fused the remaining silver I had, and converted the nitrate into the black oxide of copper, dissolved and filtered, and made into silver bath for paper, and all worked well. I send you a print, that you may judge how strong the bleaching action was, said print being printed to the usual depth.

A New Use for a Photograph.—In a recent action for breach of promise, the following extract from a lover's letter was read. He wrote from Killarney:—"I only hope he (alluding to a photographer) may succeed in doing you as much justice as he did me. I assure you I have not sent yours to the bottom of the lake—what is more, I have no intention of doing so. I wish your real dear face were here. If it had been, no doubt we should have caught some salmon last week; for, far from frightening the fishes, I think they would come up to see your fair countenance."

CONTRIBUTIONS TO A NATIONAL PORTRAIT GALLERY.—The editor of the *Daily Telegraph*, referring to the National Portrait Gallery, says:—"To make our British Walhalla truly national, we should descend much lower than perhaps the tasteful curators of the collection in Great George-street are willing to do. We should fish obscure merit out of the depths, and drag remarkable but diffident roguery out of its secret penetralia. An intelligent photographer, who set up his studio about Drury-lane or the New-cut, might in the course of a few months get together such a series of *cartes de visite* as would prove exceedingly valuable to the future historian, however they might be disregarded or condemned by the present generation. The naturalist who figures the lordly golden eagle, or descants on the form and habits of the colossal elephant, does not disdain to study the appearance and manners of the ugliest reptiles, and the most disgusting vermin. It is all very well to have a collection of English "worthies;" but should the "unworthies" be allowed to depart from the scene of life without notice, and without portrayal? Have not the rogues a claim to the attentions of the camera? Shall the impostors go unpainted? Are cheats and vagabonds and humbugs of all kinds to find no place in the Social Zoology? It would be extremely unwise to admit such a principle of exclusion."

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To Correspondents.

J. S., Bruges.—Your print is not toned at all, but simply fixed: hence the foxy unpleasant colour. In toning with sulphocyanide of ammonium and gold, you must have a very much larger proportion of the latter. From 1 to 2 grains of chloride of gold should be used with each ounce of the sulphocyanide, whereas you used only 1 grain with nearly 4 ounces in nearly a quart of water. We have had a good deal of experience with the toning bath of sulphocyanide of gold with uranium and collodio-chloride of silver prints, and one of the chief difficulties we have found is too ready a tendency to tone to a blue black. Several correspondents have sent us examples in which we have marked a similar tendency.

P. C. J.—There is no reason why a photograph enamelled with collodion and gelatine should rapidly fade and discolour, nor have we ever seen or heard of one except yours doing so. We have had some many months in our possession without any change. If the enamelled print you forward were anything like the unenamelled one, it has certainly deteriorated very much. Was the collodion you used plain or iodized? If the latter, the discolouration may be explained.

G. H. M.—A good portrait lens is best. Try your half-plate.

JAMES THACKEAAY.—You must apply to the advertiser at the address he gives. We know nothing whatever of the matter.

H. T. G.—It is impossible to give the definite quantity of salt to be used to reduce the silver from your washing water to a chloride, as we cannot tell the amount of silver present. You may, however, observe two rules with propriety: In the first place do not use more water than is necessary, as by doing so you would keep the precipitate in suspension; and do not use too much salt, as a strong solution of salt redissolves the chloride of silver; hydrochloric acid is best on this account. Before drawing off the water test it to see that all the silver is thrown down. Read an article on p. 594 of our last volume.

SIMON DE BRUGGA.—The engraving you mention is, we believe, copyright. It is doubtful whether you can copy a copyright work, even for your own use; it has been held that gratuitous distribution of such copies is piracy.

CARMINE.—Protosulphate of iron is soluble in about twice its own weight of water, one ounce of a perfectly saturated solution added to 15 ounces of water, will give a solution of 15 grains to the ounce. 2. If your negative fogs, and you are certain that it is not from the condition of any of the chemicals, it may be from diffused light in the camera; examine it carefully. 3. Add a little prepared oxgall to the colour. 4. The surface of glass is often injured by soaking in a solution of soda; but we are not aware that the glass will be made more brittle.

V. P.—In asking the "real difference between a good landscape lens and a triplet," you ask a somewhat indefinite question. Do you mean in construction, or working, or result? We presume you probably mean the latter, in answer to which we may say that the chief difference is in the matter of distortion. With a single landscape lens upright lines are rendered with barrel-shaped curves; whilst the triplet gives the lines straight. This is chiefly apparent in architecture and reproduction of subjects with straight lines. 2. You cannot get entire freedom from distortion with the single lens. 3. Several are good, but, probably, *b* is best. 4. We cannot mention makers' names here. 5. We have no experience with them. 6. Cracking may proceed from many causes, but most frequently from imperfect washing after fixing. If traces of the fixing salts are left in the film, and the negatives are afterwards subjected to damp, the film would be very liable to crack.

PHOTOGRAPHIST, Bath.—The registration of a design, and the registration of a form of words to secure copyright are two distinct things, and both are different from registering a photograph. Our publisher only undertakes the latter.

H. Y. P. O.—The imperfect tone is due to imperfection in the negatives. Without a brilliant negative you cannot obtain brilliant prints. With a more brilliant negative and deeper printing you would obtain better prints with same printing and toning appliances.

C. B. P.—The chief fault in your street views is under-exposure and over-development. The same is true of the church, but it is better; the chief fault with it being over-development or intensifying. 2. Iodized collodion is meant; but we cannot recommend you to try the process except for experimental purposes. 3. Magnesium wire can be burnt without a lamp, but not conveniently.

TEAGARG MO GRA.—The pink deposit of gold in the light would suggest that you had toned in daylight. A copper kettle will answer very well. Protosulphate of iron will precipitate the gold from the waste solution.

J. M. BURGESS.—Thanks for the further specimen. We will notice them next week.

ALPHA.—If you have an open expanse of sky opposite your lights, without buildings or other objects intervening, your planned glass-house would answer; but on the whole we should prefer the simple rectangular shape and ridge roof, with all glass except the two ends, and about 6 ft. overhead, and at each side of the sitter opaque. Blue glass is of no advantage. White and dark blue calico is best for blinds. Thanks for your suggestion.

WM. BARTHOLOMEW.—Thanks. The suggestion deserves serious consideration. It shall have our attention.

C. HARRIS.—Yours is a very hard case indeed. You do not state whether your letter is intended for publication. Let us know. Publicity is the only resource left for you in order to shame the prosecutors from proceeding in such a business. We will give the subject our attention, and shall be glad if we can give you any efficient advice.

VERNANT.—Thanks for your letter and information. It is doubtless the same person. We shall reserve publication of the matter at present. We will return the printed enclosure.

D. C.—The quick-acting single lenses you mention are only made for stereoscopic pictures, we believe. But we will endeavour to ascertain, and let you know.

GEORGIUS.—We have not noticed the advertisement to which you allude, but it doubtless refers to Mr. Haes's pictures.

"ONE WHO STUDIES THE NEWS."—A loose tin case, which would permit the glass bath to be immersed in cold water during very hot weather, would scarcely serve as a travelling protection to the bath. 2. Vulcanized india rubber, containing sulphur, is scarcely safe to come into contact with the silver solution. You may cover the surface with a thin sheet of common india rubber or gutta percha. The registration of designs is a distinct thing from the registration of photographs, and at a different office. If you take a copy of the design you wish to register to the office for the registration of designs, the registrar will tell you, we believe, whether it is or is not registered. A single picture made convex would not be an infringement of the Diamond Cameo copyright; nor could it be made copyright. We shall be glad to see the sketch of your travelling dark room.

F. G. B.—Thanks for the hints and information. We are kept well informed of the proceedings in question. We leave the matter to effect its own cure; evil machinations generally recoil on the originator, whose folly in this case reminds us of the proverb, "*Quos Deus vult perdere prius dementat.*"

YOUNG PHOTO.—The best mode of making collodion give a more creamy film, is to add a little more pyroxyline. Immersing a coated plate is the simplest plan. Adding bromide to a simply iodized collodion will of course make it bromo-iodized. The effect of a bromide is generally to give more softness and cleanliness, and often more sensitiveness. You need not hesitate to ask questions; we shall have pleasure in assisting you.

J. S.—Read our article on p. 361, vol. vi. on the subject. 2. Probably your acetate of soda is impure. 3. Imperfect lighting, over-exposure, and over-development will make a black silk dress look too light; under-exposure will cause want of detail in woollen fabrics; each requires special treatment. It must be excessive bronzing which is not removed by toning and fixing. 4. Yes.

CONSTANT SUBSCRIBER.—Tracing linen is the best material for stopping out direct sunlight without materially reducing the light. You will obtain it of most stationers. White is better than blue in such cases. Tracing *linen* does not readily turn yellow. Mr. Cole, architect, and a skilful amateur photographer, showed us a sample which had retained its colour perfectly. It is quite strong enough for a spring roller.

ÆDIPUS sends us the following pun in explanation of the hostility of engravers to photography; they dislike the art-science because it is a pho (foe) to-graphic art. The pun is good, but has been used before.

C. SPRINGHAM.—We shall be glad to see the stand. Probably it would be best to exhibit it at the same Society's meeting, where the others have been shown. We shall be glad to aid you in showing it. We shall have pleasure in seeing the other improvements.

J. S. W.—Your further communication in our next.

J. TOMLINS.—Thanks. The plan shall have our attention.

ERRATA.—In our article in last number on photography on ivory, first column, twelfth line from the bottom, for "saturated with nitrate of silver," read, "saturated with nitrate of uranium." In "An Amateur's Experience," page 41, third line from the bottom, occur the following words:—"by which means a picture $4\frac{1}{4}$ by $3\frac{1}{4}$ may be washed completely; that is, after developing and after fixing;" to which should be added, "with $2\frac{1}{2}$ ounces of water." Again, in the next instance, "A spirit lamp, matches, and a little plate-cleaning solution also"—the words missed are—"should be put in the bag."

W. FEATHERSTONHAUGH.—Thanks. The matter has received attention.

W. N. H.—There is no such work that we know of.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

MR. GEORGE ROBERT BARBER, 2, Carrington Street, Derby,
Photograph (from Engraving) of the late Rev. Wm. Pickering.

MESSRS. LUCAS BROTHERS, 3, St. John's Wood Road, Regent's Park, London,
Photograph from a Painting by E. C. Barnes, entitled "Vive la Gloire."

MR. PETER SKEOLAN, 12, Promanade Villas, Cheltenham,
Photograph of the late Venerable Archdeacon Timbrill, D.D.

THE PHOTOGRAPHIC NEWS.

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CYANIDE OF POTASSIUM IN THE NITRATE BATH.

A month or two ago we received from an old subscriber about half a pint of nitrate bath, a bottle of collodion, and an unexposed excited plate. The latter was covered with singular markings, which illustrated the nature of the difficulty our correspondent wished us to solve. For a week he had been unable to get a clean picture, all the remedies he tried having been quite unavailing. He forwarded us a brilliant and delicate picture as a specimen of his usual work, and stated that in eight years practice he had not met with such a difficulty before. The exacting nature of our duties leaves us without time to examine delinquent baths; but this case interested us, and at the earliest opportunity we tested it. We began by trying a few plates with it with different collodions. The first plate was tried with the sample of collodion forwarded by our correspondent, which was by a well-known maker, and which in another bath gave good results. The plate showed some singular transparent markings before exposure, and on development showed a slightly foggy tendency. We next tried another commercial sample which we knew to be more highly bromized than the preceding; the marks were less apparent, but still there. The next two plates strikingly illustrated a position we have often enforced, the advantages of a bromide in securing cleanliness. A simply iodized collodion in good condition was tried, and a most virulent example of markings, spots, comets, &c., was produced. A very highly bromized collodion was tried next, and we obtained a plate free from markings of any kind; but the image was without vigour, grey, and thin. It was clear that from some cause the bath was in very bad condition: with some samples of collodion the general character of the negative was moderately good, but the peculiar markings were present, generally of a zigzag form, almost like forked lightning, showing quite transparent, and free from deposit of iodide of silver, when the plate was taken out of the bath. We had seen something similar before given by an old and long used bath; but never in such a virulent form. The bath was slightly acid apparently with nitric acid, just sufficiently to have produced ordinarily good working conditions, and we found on testing that it contained about twenty-five grains to the ounce.

We next adopted the simplest and usual form of rectification. We strengthened and then neutralized the bath with carbonate of soda, and sunned it. This produced some amelioration, but the bath did not work well either at once or when slightly acidified. We now resorted to a somewhat empirical remedy, which we have before mentioned more than once, the addition of cyanide of potassium. A few months ago, Mr. Blanchard described in these pages a case in which a bath in obstinately bad condition, which resisted the ameliorative action of carbonate of soda, ammonia, sunning, &c., was cured by the addition of cyanide of potassium. Since then several professional and amateur photographers have mentioned to us similar facts, and have also pointed to the extreme excellence in colour and richness of the negatives obtained from a bath so treated. We resolved to try the virtue of cyanide on the bath in question, and a little of a fresh solution was added to the bath, just sufficient to cause a permanent turbidity. The solution was then placed in the feeble light of a winter sun, which gleamed out fitfully at intervals, during about a week. A very short exposure blackened the particles of cyanide of silver in suspension, and finally the solution became perfectly bright and clear, having deposited a copious precipitate, which was removed by filtration.

We now tried the bath, without any addition of acid, with one or two samples of good commercial bromo-iodized collodion. The result was surprising. The film on removal from the bath presented a perfectly even creamy coating free from marks of any kind. On applying the iron developer after exposure, the image came out with remarkable vigour, with dense lights and clean transparent shadows. The deposit was of rich chocolate tint, inclining to ruby, and when the exposure was short, requiring a longer application of the developers; the deposit was black, the shadows still remaining quite clean, and, in all cases, there was perfect freedom from the zigzag markings which were so persistently present before.

We cannot entirely account for the result by a consideration of the means, nor have we met with any suggestion which professes to do so. The gentleman to whom, three or four years ago, we were indebted for the information, Mr. James Tulley, of Sheffield, if we remember aright, informed us that he used it constantly, just adding about a tea-spoonful of the cyanide solution out of his fixing bath whenever his bath was out of order, a bath which appeared like "pea-soup," quickly yielding to the remedy. At the outset it would appear that the addition of cyanide, causing a precipitate of insoluble cyanide of silver, aided, as such precipitates do, as is well known in adding carbonates to the silver bath, in carrying down foreign matter as well. But in this case the work was much better done by the cyanide; and in this and in many other cases brought under our attention, the quality of the negative obtained from the bath so treated was richer and better than before, besides the removal of other evils. It is probable that some trace of cyanide of silver is dissolved in the nitrate solution, and that this aids in giving vigour and richness. M. Perrot de Chameux described, some months ago, in one of the foreign journals, some experiments by which he arrived at the conclusion, that the presence of a salt of potash in the bath was favourable both to rapidity and vigour; and many old photographers still swear by iodide of potassium in collodion as giving the most sensitive film, and the most vigorous negatives. Whatever may be the cause, it appears tolerably clear that there are many conditions in which this addition to a disordered bath is the best corrective, and that it aids in obtaining an amount of vigour and richness of tone in the negative not always readily attainable by other means.

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HERR WOTHLY'S UNDISCLOSED SECRETS.

Some time ago we had occasion to refer to a rumour, which at length took tangible form in a Paris contemporary, to the effect that the United Association of Photography had not included in the publication of the Wothlytype process all the secrets disclosed to them, or that Herr Wothly had himself suppressed important parts of his process in communicating it to the representatives of the Association. We felt bound to the photographic public to mention the rumours and statements circulated on this subject, as vitally affecting the reputation of a process which even its detractors must admit is very elegant in detail, and beautiful in result, and which, even if it do not supersede the present method of printing, is capable of a variety of applications of great value. We thought at the time that it would have been wise on the part of those concerned to notice in some way these allegations; but it was no part of our duty to seek personal explanations, which might have had the appearance of prying into what concerned us not. Recently, having been invited by Col. Stuart Wortley, however, to examine some further progress in their printing arrangements, this topic naturally came on the *tapis*, and we learnt that there was no ground for the rumour whatever, that every essential particular was included in the English specification: and a few days later we received from the secretary of the Association a letter, giving the rumour an authoritative denial, which runs as follows:—

> In allusion to the question you put to the Chairman of the Board of Directors regarding Herr Wothly's having kept a portion of the process secret from us, I am desired to explain to you that such was not the case.
>
> The temporary difficulty we experienced in the months of November and December was due to the following causes:—
>
> The difficulties of obtaining nitrate of uranium of sufficient purity. This has compelled us to manufacture our own from the oxide.
>
> The fact that the proportions of silver and uranium giving satisfactory images in the bright light of summer were found, by a series of experiments, to differ much from the proportions necessary to give the same image in the weak light of winter. We have, therefore, in communicating the process to our licencees, given them not only Herr Wothly's own formulæ, but also those which we ourselves have found more suitable for use in the weaker light of this time of year.
>
> Pray publish whatever extract from this letter you think fit. —I am, yours obediently, W. M. Brown.

The reader will naturally ask the possible origin of the rumour. We think we can form a tolerably accurate conjecture. It appeared, in conversation, that Herr Wothly attaches as much, or more, importance to his negative process as to his printing process. Everyone who has seen the fine specimens first exhibited by the Association, has been struck by the excellence of the negatives capable of yielding such prints. The negatives are very brilliant and very dense, yet produced with iron development only. The particulars of his method of producing them, and various other manipulatory details, he communicated to the Association; and it is probable that it was in allusion to these matters that he remarked to the effect that the matters unpublished in the specification were equal in value to those made known. Be this as it may, we hope shortly to lay them before our readers, as Col. Wortley, with ready courtesy, placed the details at our service.

What may be the ultimate value and position of the Wothlytype process we do not pretend to determine. Certain it is, that we saw many very beautiful results, and a rapidity of printing not equalled by the most sensitive albumenized paper.

PHOTOGRAPHIC EXHIBITION AT BERLIN.

We call the attention of our readers to the regulations of the International Photographic Exhibition, to be opened in Berlin on the fifteenth of May next, and remain open for a month after that date. The subject has already been brought before our readers some time ago, by our excellent correspondent, Dr. H. Vogel, the president of the Berlin society, but we have not, until now, had space to devote to the conditions for the guidance of contributors. We hope all our readers who can send good pictures will do so, and thus enable England to bear a worthy part in the display. The following is the programme of the arrangements:—

1. The Berlin Photographic Society intends to arrange an International Photographic Exhibition, which is to begin the fifteenth of May, and to continue during the four weeks following.

2. The Exhibition will consist of all branches of Photography,—portraits, groups, landscapes, architecture, reproductions, enlarged and microscopical photographs, instantaneous views, photographs of animals and plants, &c., &c. Besides, it will illustrate the many applications of Photography to Art, Science, and Industry: photolithographs, photographic engravings, photosculptures; photographs on china, glass, and enamel; examples of the application of Photography to war, architecture, and engineering (*e.g.* pictures of engines, ships, &c.): to natural science, medicine, justice, commerce, mechanics, &c., &c.

Furthermore, the Exhibition shall give a tableau of the History of Photography, and for that purpose examples will be exhibited, which illustrate the processes used since the origin of our art, and the gradual improvement of them. The committee begs possessors of such examples of historical value to send them to be exhibited; likewise it wishes to have exhibited proofs of the newest methods, as carbon-prints, uranium-prints, pictures on dry plates, &c. Other objects for the Exhibition are: photographic apparatus, chemicals, frames, furniture for the studio, and photographic literature.

3. Notice of articles to be exhibited is to be sent in, post-paid, before April 1st, 1865, with specification of the nature and number of objects, and the breadth and height of room claimed for them, to Mr. Ferdinand Beyrich, 101, Friedrichsstrasse, Berlin, who will give further information on receipt of post-paid application.

4. The articles themselves must be sent in before May 1st, 1865. Objects arriving after this time cannot be taken notice of. The articles should also be sent to Mr. Beyrich. For the compilation of the Exhibition Catalogue, a special list of contents is to be added to every article sent in, containing all explanation the exhibitor might wish to have published by the catalogue; if the articles are to be sold, the price of them, &c.

5. The photographs to be exhibited are to be exposed *in frame under glass*. The framing of the photographs may, if requested, be provided by the committee at the charge of the exhibitor. Photographs of exceedingly large dimensions may, if requested by the exhibitor, be exposed without glass over them.

6. The *returning* of the articles cannot be done sooner than two weeks after the Exhibition is closed.

7. The expenses for sending in and returning articles are paid by the exhibitors. To facilitate the conveyance, agents employed in the capitals of Europe may be applied to.

For the United Kingdom Mr. Trübner, St. Dunstan's Hill, London, has engaged himself as agent for conveying the articles delivered to him.

Of course exhibitors may send their articles directly to Mr. Beyrich.

8. Fire insurance is provided by the committee, but although all possible measures will be taken to protect the articles against theft or other injuries, the committee cannot answer for such damages.

9. The Exhibition-Committee claims the right of excluding from exhibition articles of no value, or not corresponding to the statements of this programme.

10. The committee is trying to procure exemption from custom. Further information thereof will be given as soon as the exemption is granted.

Committee of the Berlin Photographic Society.—MM. Ahrendts, Bette, Beyrich, Jacobsen, Jamrath, Juhre, Marowsky, Suck, Vogel, Zschille.

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APPRECIATION OF ART IN PHOTOGRAPHY.

BY W. WARWICK KING.

At a recent meeting of the North London Photographic Society, when Mr. Highley was exhibiting some transparencies, by means of the magic lantern and oxyhydrogen light (the subjects being most successful reproductions of some of Julius Schnorr's Bible prints), he was asked why he did not publish some photographs of Albert Durer's wondrous etchings, which have retained their value to the present day, and given their author a world-wide fame, not only for the excellence of the work, but for the true artistic spirit displayed therein, showing how well those who have lived before our day knew how to combine "the arts of design with the arts of production." The answer was, that the public would not appreciate them, they would not, in fact, sell. No doubt, on the surface, a deal of truth is apparent, but on closer examination, I think it is scarcely correct. Few of us there are who can forget the ridicule which was cast in no scant measure on the early productions of the Pre-Raphaelite school, crude they may have been, but nevertheless, the spirit they evidenced was founded on truth, and its earnest-minded followers held their ground, invigorated by the sharp wind of criticism, and finally triumphed in the productions of such pictures as Holman Hunt's "Christ in the Temple," and the "Light of the World," and John Everett Millais's "Huguenot" and "Order of Release." No one can deny the position which these works have attained in the estimation of the public, and the interest which the announcement of any new paintings by these artists evokes. Again, look at our architecture; some years ago churches were built like theatres or market houses, but now they are more fitted for their sacred use. Occasionally, but happily very rarely, one of the old-fashioned buildings, peculiar to the dark age of the last century, springs up, such as Mr. Tite's notable failure at Ferrard's Cross, Bucks; but the truth is too strong, and English architecture, in church building at least, reigns triumphant. Who, however, at the outset would have expected such a result as this, when even the glorious remains of mediæval architecture throughout this country were named in derision "Gothic," as if they were simply the work of a barbarian race.

To come more closely to our subject. When stereoscopic slides were first introduced, the most popular subjects were wretched groups of figures, but soon, fortunately, the late Mr. Grundy produced some slides with figures arranged in an artistic manner; next came Mr. Bedford with his architectural views, and Mr. Russell Sedgfield with what were then considered marvels, interiors of our minsters and cathedrals. Now we have such views as Mr. Bedford's perfect interiors of Hereford Cathedral and Ludlow Church, without mentioning Mr. Wilson's most successful works. The popularity which these late productions have achieved, shows that they are appreciated, and what is better still, the wretched groups, through the happy influence of old hypo and better taste, are now "fading away." Reverting to the idea expressed in my remarks on Albert Durer's works, Mr. Philp, of Orchard Street, Portman Square (whose efforts to introduce the best productions of foreign engravers' art are well known and appreciated), informs me that he has a large sale for reproductions from the works of Albert Durer and Martin Schoen, and a still larger sale for those marvellous engravings of "Death the Avenger" and "Death the Friend," by the late Alfred Rethel. Messrs Williams and Norgate, the eminent foreign booksellers, confirm this statement, as they dispose of large quantities of the two last named. It is said that the English nation cannot appreciate anything unless it is useful; I need say nothing on the abuse of this term, which has been so well exposed by Mr. Ruskin in his second volume of "Modern Painters," but I deny that the English do not love art or anything that tends to its encouragement. They do appreciate what is true and beautiful, and detest anything like the so-called puritanical simplicity; if ever they do approve of such nonsense, it is entirely the fault of those whose duty it is to lead them; who are those? surely the art professors. It is they, and they alone, who vitiate the public taste. The architects alone are responsible for our tasteless buildings, it is far more easy to build a house in form like a candle box on end with holes cut in it, or rows of houses correctly described by the celebrated Canova as long walls with slits therein, than to give the thought which Gothic architecture requires. And photographers who, by the very nature of their art, are artists, will be guilty of the same indolence and wrongdoing, unless they work for the future as well as the present. If they will only put good subjects before the public eye, it will soon detect and reject those that are bad; let them do their best to direct the public taste in a proper channel, rather than to follow it in its errors. It will soon know what is right and yield hearty adhesion thereto. If things are made simply to sell, they may give a present profit, but the good will remain a source of lasting interest, and afford some satisfaction not only to the producer, but to those whom his productions rightly interest, and consequently benefit. I may mention that Herr Schauer's photographs of Durer's S. Hubert and Melancholia, have sold largely.

THE WOTHLYTYPE PROCESS.

BY H. COOPER, JUNIOR.*

I, this evening, have the pleasure of bringing before you the results of some further experiments with the Wothlytype process. Unfortunatly, they have not been so complete as I could wish, owing to the unfavourable weather. Besides working the process generally, I jotted down several points for especial experiment, to enable me to make up my mind upon them as far as possible.

These are to accertain the best proportions of nitrate of silver, and to observe the difference in quality of print, sensitiveness, &c., produced by varying the quantity. Next, to alter the quantity of nitrate of uranium with a fixed proportion of silver; and then to carefully try and find out the effect produced by rendering the sensitized collodion neutral or alkaline, also by adding other salts to it.

I have at present only got over the first point. And before giving an account of the results of the experiments, I will tell you the way I set about them. I may incidentally mention that for carefully observing the difference of effect in using samples of pyroxyline, I have first saturated the ether and alcohol with the uranium, and then dissolved the cotton in them. By this means I have always got a fixed proportion of nitrate to the ounce; or in other words, two collodions made from different samples of gun-cotton contained in each ounce the same quantity of uranium. I have found that if the cotton be dissolved in the ether and alcohol first, and then the uranium be introduced, it depends upon the character of the pyroxyline as to how much of the salt will be taken up by the collodion. You must bear in mind that in working with the commercial plain collodion it is almost impossible to know what quantity of the nitrate of uranium has been dissolved by it. The reason just given is one; another is, that as ether will be take up much more nitrate of uranium than alcohol does, and the quantity dissolved by the latter depending somewhat upon its specific gravity, we cannot possibly accertain how much of the salt our collodion contains unless we know the proportions of alcohol and ether used in its manufacture.

For my experiment, (No. 1 we will call it) I took 15 ounces of alcohol, sperfic gravity, 820, saturated with nitrate of uranium, and 5 ounces of ether also saturated, and in them dissolved 100 grains of pyroxyline, half of which was from a quantity prepared by Mr. Blanchard, and the other from some of my own, made according to the formula given at our December meeting.—After perfect subsidence it was divided into ten portions, which were numbered in order—1 to 10.—A solution of nitrate of silver in alcohol, specific gravity 824, of 16 grains to the ounce, was prepared by well pounding together in a mortar. I may here mention that it is useless attempting to obtain a saturated solution of nitrate of uranium or silver in alcohol by simply shaking up the salt, either in crystal or powder, in the solvent. The salt must be placed in a mortar, a little spirit poured on it, and then well pounded; then pour off the alcohol, and treat the whole of it, little by little, in this manner.

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* Read at a meeting of the South London Photographic Society, February 9th, 1865.

With the uranium the solution will very likely be cloudy, and will deposit, after standing, a white powder; this will generally be nitrate of soda, or other impurity in the uranium salt. In the case of dissolving nitrate of silver in *methylated* alcohol, the solution will in most cases gradually become of a red or chocolate colour, and will throw down a marrow tinted precipitate. I have removed the colour by introducing a little animal charcoal. To each ounce of collodion No. 1, 15 drops of the solution were added. This will, of course, be equivalent to half a grain of nitrate of silver. To No. 2, 30 drops; to No. 3, 45 drops; and to No. 4, 60 drops. To continue the addition of the silver when I got to No. 8, I made use of an aqueous solution of the nitrate, containing 50 per cent of the salt. Every two minims of this will be equal to one grain of nitrate of silver, therefore No. 9 had one drop of the aqueous solution, and two drams of the alcoholic. As the collodions now stood they were almost valueless for experiment, as the higher numbered ones contained more alcohol than the lower ones; to remedy this defect sufficient plain alcohol was added to each to make them equal, and from 1 to 8 two drops of distilled water.

To test these collodions, separate portions of the same sheet of paper were coated with them, the number of each being marked on the back.

That with only half a grain of nitrate of silver, gave an exceedingly feeble print of a yellow colour. That with one grain showed a slight improvement. And each number gave a richer and better print than the last. From these experiments I think that 3 grains is the minimum quantity of nitrate of silver that can be used satisfactorily; and that there is no necessity to use more than 5 or 6 grains to the ounce. Although those collodions which contained a small proportion of silver gave such very feeble prints; they printed excedingly rapidly. The addition of more silver greatly enriched the image, but slightly retarded the sensitiveness; so that the rule, that "sensitiveness and brilliancy are in an adverse ratio," holds good in this case. Another thing on which I was desirous of satisfying myself was the keeping properties of the sensitized collodion and paper. The great discrepancy observable has been most tantalizing. For instance, I sensitized a piece of paper, kept it for ten days, then printed on it, and kept it for a month before toning and fixing. The result was a perfect print. In other cases the paper has discoloured in a few days. It has been generally found that the most sensitive paper discolours the most rapidly. And so with the collodion. Some that has been sensitized four months has not discoloured in the least, while some have acquired a reddish tint. Among the latter is a little of a sample given me by the Association, which I had purposely put by to test it in this particular.

I have observed that, in some cases, the qualities of the collodion have changed by keeping. I will give one example. A collodion, marked No. 13, printed to a rich brown; after being kept for two weeks it gave a greenish image in the printing frame, with the same quality of paper. Of course, with different papers, and different sizing, different tints will be produced by the same collodion. But I took care to use a piece of paper from the same stock, a Saxe, sized with arrowroot. I have said that after keeping for a fortnight, the prints given by the collodion were greenish; they were also printed in less time than when the collodion was fresh mixed; but after keeping the print exposed to the air for twelve hours, they lost the green tint, and became brown. I have occasionally found the prints to lose a little half tone upon keeping before toning, and it has mostly happened when there has been any tendency to green in the colour of the image.

I have met with a difficulty for which I cannot satisfactorily account, and which, at present, I am unable to entirely overcome. I refer to minute air-bubbles making their appearance upon the collodion surface. They apparently rise from the paper when the collodion is poured on it. At first, I attributed it to damp, as the paper had been kept in a room not artificially warmed. I decidedly found that moisture increased the trouble, but that no amount of dryness entirely prevented it. There has been only one way in which I have got over it, and that was by pouring alcohol over the sized surface of the paper, and allowing to dry, but not too much, and then coating with the collodion.

It has not only happened with the Wothlytype, but with any process I have tried with collodion; and as it appears continually with the paper, I am now using some samples hitherto used being free from it; others showing it to a greater or lesser extent. I am inclined to cast the blame upon the poor paper or sizing. As these little bubbles appear as pin-holes on the finished picture, it is absolutely necessary that some means be found of entirely overcoming them.

With some kinds of pyroxyline, the collodion film will rise in blisters during the washing. These will generally disappear when the print is dry, if they were not of a large size whilst wet. I have particularly noticed that when there is any tendency in the film to become loosened from the paper, that it will come off much more easily from the lights of the picture than from the parts that have been acted upon by light. It is most observable in vignettes and landscapes; I have known the collodion to become dreadfully torn on the white portion surrounding the print in the former, and in the latter, I have seen the whole of the film constituting the sky entirely sponged off; while, in both cases, the part where the image was impressed, remained unhurt. The organic matter that serves to keep the film and paper in union, being associated with nitrate of silver, becomes insoluble under the action of light, and thus holds the film and paper more firmly together on all those parts that have been acted on by the solar rays.

When I have met with a print to which the collodion seemed to be lightly attached I have stripped the film from the paper, and have been rather astonished at the difference observable on separate occasions. Sometimes the collodion film has contained only a mere trace of the image, and at others it has been impressed by far a better image than the paper. It will be most likely found that the collodions that were more opalescent, will retain more of the image in themselves. I had one print of a beautiful rich purple, and when the collodion and paper had been separated, the image upon the latter was of a ruby red, and that upon, or more correctly speaking, *in*, the former was of a rich blue tint.

In conclusion, I will give the formula for a collodion that has worked exceedingly well in my hands. Take 2 fluid ounces of methylated ether saturated with nitrate of uranium; 4 ounces of methylated alcohol sp. g. ·820, also saturated with nitrate of uranium; and 2 ounces of methylated alcohol, same strength as before, containing 16 grains of nitrate of silver to the ounce, mix and filter. In it dissolve a suitable quantity of pyroxyline, 50 grains of that prepared by Mr. Blanchard gave very good results. Of course the quantity of pyroxyline which can be used easily will depend entirely upon its character. With some very tough samples, only about 2 grains to the ounce of solvents can be used without gelatinizing, whilst 15 grains of a powdery sample can be comfortably worked. When the cotton is dissolved in the sensitized solvents, the mixture must be placed in a dark and cool place till it has settled perfectly. It is then ready for use. If, upon trial it is found to be too thick, it can be diluted with some of the sensitive solvents.

There is one remark necessary on the formula for the preparation of the pyroxyline given by me at the December meeting of this society. The receipt stands as follows :—

Nitric acid, sp. gr. 1390 ...	12 fluid ozs.
Sulphuric acid, sp. gr. 1845 ...	36 „
Water	8 „
Cotton	2 ounces.

Immerse the cotton when the acids are at a temperature of 120° Fah. and allow to remain fifteen minutes. Now, there are one or two precautions to be observed in working this formula. In the first place one fourth only of the quantity put down is to be used at one time. In some, or rather in nearly all directions for making pyroxyline, it is recommended to immerse half the cotton only at first and, after its removal, to warm the acids to the required tempature, and then to immerse the remainder of the cotton. But with the formula in question, this mode of proceeding has always ended in the second quantity being entirely useless. It is absolutely necessary that the cotton be all immersed at first. It is evident that as much cotton cannot be prepared in this way, as when it is done at twice; but the acids may be used after the addition of more *strong acid* for the preparation of other classes of pyroxyline. In my formula as much water is added as the acids will possibly bear, so that if the acids be weaker than those stated, or if the cotton be not throughly dried before immersion, the experiment will end in failure, by the cotton being dissolved by the acids. The strength of acid used is that of the ordinary commercial, but yet, to be on the safe side, it is as well to acertain the specific gravity before commencing the operation of preparing the pyroxyline.

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ON THE TREATMENT OF GOLD AND SILVER RESIDUES.

BY C. OMMEGANCK.

The employment of the precious metals, gold and silver, in photography certainly presents in an economical point of view, so great an inconvenience that a good many intelligent and zealous experimenters study to remove it. One among them appears to have been successful, we do not know to what extent: however, it appears certain that we cannot dispense with the employment of gold. If therefore, his process presents an ultimate economy, it is still a question to which public experience can alone reply. The sole advantage of his method consists, we believe, in substituting the fixing with hyposulphite of soda for another which may compromise the durability of the proofs. It is not to be doubted that the astonishing diffusion of photography during the last few years has been more or less impeded by the indispensable employment of high-priced materials, such as nitrate of silver and chloride of gold. If the whole quantity employed by photographers were lost, the operations based upon the employment of these two salts must be banished from practical industry, and even much of the beauty of the proofs would have to be sacrificed. But this is not the case, for the quantity of the precious metals fixed upon the proofs or lost during manipulation is relatively insignificant to the operator, who knows how to treat his residues intelligently.

We shall first speak of the residues of paper proofs, reserving to treat in the last place, those of negatives and of the residues of negative baths.

The quantity of silver fixed or lost in the printing of paper positives is always more than 5 per 100 of the quantity employed, and may, according to circumstances, be always maintained at less than 10 per 100. So that apart from the investment, the photographer may consider nitrate of silver, costing 80 shillings a pound, as a primary material costing 8 shillings the pound, leaving no residues. This result is however far from being attained by the majority of photographers, because they employ imperfect methods of reduction. We have tried all the methods published up to the present time, and find that the differences they give are sufficiently striking to induce us to accord the preference to that hereafter described.

We shall follow the natural progress of the preparations, by indicating successively the operations which an experience of several years, accompanied with careful calculations, have shown us as being the most favourable. The paper removed from the silver bath is put to drain over a funnel inserted in a bottle, the liquid that accumulates is returned to the bath: the square pieces of filtering paper attached to the lower corners to facilitate the draining to the last drop of nitrate of silver, are collected and burnt with the clippings of sensitized paper.

The proofs, before toning, are washed in two waters, which are collected in a jar and treated with hydrochloric acid in excess, in order to precipiate the nitrate of silver thus converted into the chloride. The gold bath, after the tonings are concluded, is put into a separate bottle, it will serve for an indefinite time, with the addition of a fresh quantity of water and its constituent salts; nevertheless, the addition of chloride of gold must be made at each new toning operation by small quantities at a time only, in proportion as its action is found to become slower: in this consists the only means of having proofs uniformly toned. If the gold bath acquires too great a volume, or from any cause it becomes decomposed, we add it wholly or in part to the washing waters, adding also the black deposit left after each toning, and put to it a sufficient quantity of a concentrated solution of sulphate of iron, with the necessary quantity of hydrochloric acid.

These quantities are sufficient when, after settling, a fresh quantity of these reagents causes no disturbance: we can then decant and throw away the clear supernatant liquid. By this operation the chloride of silver is precipitated at the same time as the metallic gold, and this latter, which in a diluted liquid is precipitated with difficulty and adheres to the sides of the vessel, is removed with the greatest facility by the chloride which envelopes it. To this advantage is added another, still greater, consisting in this, that when fused in a crucible, the inevitable losses are not of the gold alone, but of an alloy containing scarcely 2 per cent. of gold. When an important quantity of this deposit has collected, it is washed by decantation with warm water, and reduced to the metallic state by the addition of a little sulphuric acid, and the immersion of a plate of zinc: we obtain a mixture of gold and metallic silver in powder, which is washed with warm water until it comes off tasteless: it is then dried and put away until the time for making a general fusion arrives. The employment of a plate of copper immersed in the washing waters in question to reduce the gold and silver to the metallic state, gives a slow and incomplete precipitation, especially in dilute solutions, and does not permit of our disembarrassing ourselves quickly of the large quantities of water accumulated in special reservoirs.

The proofs, upon removal from the toning bath, are immersed in water before being passed to the hyposulphite solution. This water contains too much gold to be thrown away but too little to be added to the residues of the gold bath: it is added to the liquids containing hyposulphite. The hyposulphite of soda in solution in water or the fixing bath cannot properly serve more than once, or at least while from one operation to another it remains colourless.

The solutions of hyposulphite out of use are collected in a large jar or vase. The proofs on removal from the hyposulphite are washed in several waters, the first washing water is added to the hyposulphite baths out of use: when the reservoir containing these liquids is nearly full, we stir into it a concentrated solution of monosulphide of sodium (the simple sulphide), until a drop of the mixture, deposited upon a piece of paper moistened with acetate of lead, or upon an enamelled card, produces a marron brown stain. It is then left to settle. When the supernatant liquid is perfectly clear it is decanted, and when the thick portion is reached, the residue is thrown upon a linen filter. At first the liquid that passes through is thick, but it is returned upon the filter until it flows through quite clear.

The reasons for rejecting the employment of the polysulphide of potassium (liver of sulphur) are based upon the fact that this reagent produces a deposit of sulphur very troublesome at the fusion, and more especially because it occasions an enormous loss of gold which is dissolved by its influence. The quantity of gold abandoned by the proofs to the hyposulphite amounts to about 2 per cent. of the quantity of silver drawn from it. The reduction of the argentiferous hyposulphites by means of metallic zinc, is a very bad operation: it causes emanations, voluminous deposits of sulphide of zinc, and, after a certain time, of fragments of zinc very embarrassing to the operation: the reduction is slow and never complete.

(To be continued.)

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ANNUAL REPORT OF THE PHOTOGRAPHIC SOCIETY.

In accordance with annual custom, the Council of the Photographic Society of London have to render the annual account of their stewardship, to report on the progress of the Society, and submit a balance-sheet of the receipts and expenditure during the past year.

In preparing the Report now submitted, the Council have considered it advisable to depart somewhat from the precedent of former years: they desire to direct attention to the future prospects of the Society, as well as to notice its past progress.

The Photographic Society of London has been established eleven years, and the Council look back with satisfaction to the beneficial influence it has exercised on the progress of photographic art during that period. The increase in the numbers of those engaged in pursuits connected with photography has, during the last few years, been astonishingly rapid: in this country alone they form so large an aggregate body as far to exceed in numbers the whole population of many an important state. It is the ambition of the Photographic Society of Lonon to represent this great community, advocating the interests and assisting the labous of all,—working in harmony with other existing societies, but also keeping in view those causes of failure which have led to the breaking up of several promising photographic societies. Institutions, like individuals, can only achieve and maintain success by giving heed to the lessons of experience; and the suggestions which your Council now submit for adoption by the members have resulted from a careful investigation into the present condition of the Society, with the view of improving its position, and extending its usefulness.

It will be seen, on reference to the balance-sheet, that the Society is free from debt. But the financial statement of the past year shows that the expenditure exceeded the receipts by a sum of £66 4s. 10d.

The income (comprising subscriptions, £300 6s.; profits of Journal, £23 19s. 8d.) amounted to £324 5s. 8d. The expenditure (including salaries, cost of meetings, and incidental expenses, £267 16s. 2d.; loss on Exhibition, £119 12s. 4d.) amounted to £387 8s. 6d. The debts now owing to the Society may be estimated at £199 8s. 3d.

In the last four years of the Society's existence there has been very slight variation in the amounts of annual income or the *ordinary* disbursements.

	Receipts. Income. £	s.	d.	Expenditure. Ordinary Expenses. £.	s.	d.
1861 . . .	333	17	10	313	19	7
1862 . . .	362	2	2	269	3	10
1863 . . .	331	4	2	295	10	8
1864 . . .	324	5	8	297	16	2
	£1351	9	10	£1176	10	3

In the *total* expenses of the Society there was, in

	£	s.	d.
1861 a surplus of	0	1	3
1862 a surplus of	32	18	10
1863 a deficit of	166	3	2
1864 a deficit of	66	4	10

making an excess of expenditure over income of £209 7s. 11d.

The explanation of this is to be found in the losses incurred by the Exhibitions. It will be seen that the mere working expenses have been £1176 10s. 3d. during three years, whilst the receipts have been £1315 9s. 10d.

	£	s.	d.
In 1861 the cost of Exhibitions was . .	326	10	7
1863 " " . .	308	15	8
1864 " " . . .	173	5	4

The receipts were—

	£	s.	d.
1861	353	5	0
1863	115	19	0
1864	53	13	0

the total deficiency in this one item on the three years when Exhibitions have been held being £275 14s. 7d.,—the relative position of the Society, in comparison with the former year, being that at the commencement of 1864 our liabilities were £234 13s., with £470 8s to meet them, whilst at the present time the liability is £233 18s. 8d., with the sum of £413 14s. 6d. to meet it.

The serious loss entailed by the annual Exhibitions has led the Council to consider that the time is now arrived when some change is imperatively required. It appears to be generally conceded that no Exhibition of photographs can now be undertaken without loss, if conducted on the scale of former years. But it is still eminently desirable that the friends of the Society should meet together, and that an opportunity be afforded of estimating the progress of the art. It has been suggested to diminish the time during which the Exhibition is open, so as to save the heavy cost of rental, and to inaugurate the opening to the *soirée* to the Members and their friends, when the adjudication of the Medals shall be announced, and special prominence given to the great discoveries of the year.

The proceedings at the Meetings of the Society have been considered by your Council under the belief that it is especially important to cultivate that interchange of knowledge which is essential for solid advancement, so that scientific or theoretical investigators may obtain the assistance of ripe practical experience. This useful corrective process is one of the elements it is most advisable to cultivate at the meetings of the Society. It is important that the papers read be of immediate interest; but it is of nearly equal importance that the discussions they elicit should be free and full, so that those who refer to the reports for information should have many opinions to guide their judgments. The Council have specially directed attention to the obtaining a succession of practical papers for the ensuing meetings. In this they must appeal to the members generally for co-operation; and the Council would especially point out how direct and valuable an opportunity these meetings afford of bringing before the photographic world the results of individual research. All communications forwarded will be impartially considered by the Council, and every facility afforded for illustrating or explaining the views of the authors.

At the Meetings of the past Session a large number of specimens, illustrating new processes or other matters of photographic interest, have been shown or described, for which the Council desire to express their thanks to the exhibitors. In the belief that those contributions greatly enhance the interest of the Meetings, it is the wish of the Council that all such illustrations of the art shall receive due attention, and none be passed over without some official notice. With this view it has been decided that information must be given, prior to the meeting, of whatever is intended to be laid before the Members.

The proposed alteration in the days of the monthly meetings has been decided on after much careful deliberation The two national Societies which represent photography in England and Scotland have their proceedings specially reported in the Journal. It is advisable that these reports appear at the very earliset date after the meetings; but certain cogent business reasons rendered it expedient that the Journal should continue to be published in the middle of the month, and on a stated day. The proposed change in the days of the meetings, henceforth to be held on the second Tuesday in each month, will allow authentic reports of both the above-mentioned Societies to appear within a few days after the Meetings.

The managment of the Journal has engaged the attention of a committee specially appointed to consider that subject. It is hoped during the ensuing year to make such alterations and improvements that the *Photographic Journal* shall be received as a reliable exponent of whatever is valuable in reference to the photographic art

The Council recognize with pride the co-operation of ladies in photographic work. The walls of the Exhibitions have borne evidence of the excellent practical results produced by them. And the Council feel assured that the early death of a noble and gifted lady, a member of the Society, whose photographic skill was only one of many bright accomplishments, will be deeply regretted by all who saw the exquisite photographic pictures exhibited by the late Lady Hawarden, In introducing the name of the newly elected Vice-President, the Council would refer to the number of photographers of eminence among the ranks of the medical profession. Many of them, like Dr. Wright, have been chiefly led to the study of the art through a recognition of its value in exactly delineating disease, without that irksome length of time required for a sketch even approximately accurate. The names of Dr. Diamond, of Dr. Arthur Farre, of Dr. Julius Dolfuss, of Dr. W. Budd of Bristol, of Professor Bealo of King's College, deserve especial mention. And the beautiful microphotographs of Dr. Maddox and of Dr. Duchesno testify the importance of photography in demonstrating with unimpeachable accuracy the appearances of minute structure as revealed by the microscope. The time is probably not far distant when physiology will depend on photography for reliable illustrations of the subjects on which it treats.

The newly elected Members of Council are Major Gresley, Mr. Mayall, and Mr. Shadbolt, all of them photographers of such eminence that the mention of their names will ensure immediate recognition of the reasons for their nomination.

During the past session the following papers have been read :—*

Mr. Henry Cooper, jun., on the Application of Double Printing.

Mr. Hanbury, on a Convenient Washing Apparatus.

Mr. Swan, on a New method of Carbon Printing

Mr. Hennah, of Brighton, on Positive Printing.

Mr. Sydney Smyth exhibited the application of the Magnesium Light.

Mr. Henry Cooper, jun., on Printing with the Salts of Uranium.

Mr. Hughes's valuable communication on the Tannin Process.

Dr. Maddox on Photomicrography, illustrated by some of the more remarkable specimens by Mr. How, by means of the Magic Lantern.

Mr. Haes on Zoological Photography, illustrated by a series of Pictures.

Mr. Johnson also exhibited and explained the New Pantascopic Camera.

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ON PHOTO MINIATURES, OR PICTURES ON OPAL GLASS.

BY WILLIAM F. SPILLER.†

The most recent improvement that has been introduced into the photographic world, all are doubtless aware, is the photo miniature, a very pretty picture, both plain and coloured, made upon a surface of opal glass. In a previous number of this journal was described a process for making them by transferring (the Diaphanotype). In this and future papers I propose to give three additional processes for making these pictures. First, one for making them with collodion, and then, one for albumen, and the third, for direct printing by contact, as in ordinary photographic printing. The first of these (with collodion) is, in my opinion, the most simple, and, for a beginner, the most comprehensible. Where the operator wishes simply to make a plain photograph, the opal glass may be used in its polished state; the glass is passed through the acid, and washed and cleaned in the same manner as when making a negative picture; it is then coated with the sensitized collodion, and placed in the silver bath; next comes the exposure in the camera, after which the image is developed with a weak developer of proto-sulphate of iron. When the image is sufficiently brought out, the picture is washed and cleaned in the usual manner with hyposulphite of soda, and again carefully washed to clear it of the hypo. The image will now be of a pale brownish colour, and will require toning to bring it up to its proper tint. This is done by covering the plate with a weak solution of sulphuret of potass in water. Great care must be taken not to have this solution too strong; the water should be barely discoloured, and the action should be stopped as soon as a fair approach to the proper tint is obtained. If the sulphuret is left on too long, the picture will become smoky, which is also the case where the image is over-developed. The picture is now washed again, and finely toned by placing it in a solution of hyposulphite of gold, made as follows :—Chloride of gold, fifteen grains, dissolved in water (about six ounces); hyposulphite of soda, fifty-five to sixty grains, dissolved in three half pints of water; add the gold solution by degrees to the hypo solution, and shake it well together; then let it stand in the sun until it becomes perfectly clear. When the tint of the picture is satisfactory, it may be washed and set aside to dry, after which it may be varnished in the ordinary way. Where it is intended to colour the picture, the opal glass surface must be finely ground with white flint (powdered), and instead of varnishing, it should be floated while wet with a solution of white glue, dissolved in cold water (not too strong), and then dried, when it is ready for the colourist. In making these pictures, a copying camera is used, the negative being set up in front as in ordinary copying, and the light transmitted through the negative. Pictures may thus be obtained of any given size, and a very few trials will give the necessary experience to the careful student.

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ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

Lithography.—I have stated that Senefelder discovered, about the year 1705, the principle upon which lithography is based, but it was not till 1819 that much progress was made in the art; but at that date, owing to the fostering care of Baron Aretin, in Munich; Count Lasteyrio, in Paris, and Mr. Rudolph Ackerman, in London, an account of the art of lithography, showing its then state, appeared. The establishment of the art of lithography in England is, however, due to Mr. Hullmandel, who not only drew upon stone with crayons, and printed from them in black ink, but soon carried out the process by drawing on two or three stones, and printed from them with ink of a neutral tint; he also drew on several stones, and printed from them in colours. Mr. Hullmandel introduced the process known as lithotint, the drawing being made upon the stone with a brush and liquid ink, and he also applied the process of stump drawing. The facilities which drawing with the crayon, the stump, and the brush, afforded for the production readily, and at a moderate cost, of a surface from which to print, soon gained for the art a large amount of public support, and enlisted the sympathies of the late Mr. Mulready, Mr. J. D. Harding, Mr. Louis Haghe, Mr. James Ward, Mr. J. Lane, and other Royal Academicians and artists, who applied themselves to the production of sketches on stone. There was, however, in the early attempts at lithography, a crudeness of effect and a want of gradation from light to shadow. To overcome this, Mr. Hullmandel made a material between ink and chalk, which, being applied to the hard edges, carried the full tints by gradation into the high lights. The effect thus obtained advanced the art in the estimation of artists as it increased the facility for producing artistic effects, which was also greatly helped by the use of tinted paper and printing in neutral tints from several stones. Printing in colours was practised by Senefelder, but his early specimens give but a faint idea of the richness and beauty of the productions of Mr. Owen Jones, who applied himself to develop the powers of lithography, and who not only drew upon stone, but also printed in gold and colours the whole of his work illustrative of the Palace of the Alhambra. In addition to drawing on stone and printing in flat colours, he introduced a method of printing from graduated tints drawn in ink only upon the stone, graduating his tints by stippling upon polished stones with a fine camel-hair pencil.

Litho-tinto is a method of drawing, in which washes of ink are applied to the surface of the stone, but it is not largely in use, though many artists have employed the process in the reproduction of their own sketches. The process of stump drawing by Mr. Hullmandel afforded great facilities for the production of even and graduated tints over the stone, and soon became a process in general use. The cost and inconvenient weight of the lithographic stone led to a desire to find a substitute, and for a large amount of commercial work, drawing on zinc has been found to answer, and is now extensively in use. This fact leads me now to refer to the commercial, rather than the artistic use of lithography.

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* The list of papers read during the session was by an oversight omitted in reading the report at the meeting.

†. From the *Philadelphia Photographer*.

* Continued from page 68.

I have said that the discovery of lithography gave a means of printing from the surface in a manner similar to the process of printing from type or wood blocks, but owing to the slight relief of the drawing on the stone, and the necessity for wiping it with a wet sponge, and gumming the surface of the stone to prevent the absorption into the stone of the grease from the ink, the process is nevertheless a tedious one, but this evil is in a measure compensated for, by the facility which the lithographic process affords for multiplying copies of a drawing when once made, by transferring an impression taken from the drawing first made to a second portion of the stone, and as this can be repeated to any extent, a number of copies can be printed at one operation—the only limit being the size of the stone, and the nature and size of the design to be printed. The want of an efficient substitute for steel and copper plates, in the form of a surface block from which to print the type in ordinary type printing-presses, still remains a desideratum, notwithstanding all that lithography has done, and the many attempts which have been made. Casts in relief from engraved copperplates were among the earliest efforts in this direction, but the cost and labour of producing a uniform surface fit for the printing-press, has not hitherto led to a commercial success.

Electrotype.—We now come to a period in the history of engraving at which another new discovery was given to the world, and one which has since played an important part in the arts. I refer to the discovery of the process of electrotyping. In the year 1800, Volta, in a communication to the Royal Society, announced his discovery of the Voltaic pile. By its means Nicholson effected the decomposition of water and of several metallic salts. Cruikshank next invented the galvanic battery, to the positive poles of which he attached silver wire, the other ends of the wires being placed in a glass tube containing a solution of acetate of lead. When the electric current had passed through the solution for some time, metallic lead was found deposited on the negative pole. Brugnatelli observed the transfer of the elements of a decomposed compound from one pole to another. In 1801 Wollaston made the following observation, viz.:—That if a piece of silver, in connection with a positive metal, be put into a solution of copper, the silver is coated over with the copper, which copper will stand the operation of burnishing. It was not, however, till after the discovery by Daniell of his constant battery, in which copper is continually reduced upon the negative plate, that it was observed that the newly-deposited copper, when stripped off, had upon it a counterpart of every scratch on the plate upon which it was deposited. In 1837, Mr. Spencer, of Liverpool, discovered that if a portion of the surface of the negative plate was covered with varnish, then no deposit took place upon those parts. He next conceived the idea of applying this process to the arts, by coating a piece of copper with varnish and wax, and cutting a design through it so as to leave the copper bare, and then depositing a metal upon these parts, so that on removing the varnish the design would be left in relief; but no account of these experiments was published till September, 1839. In May of that year it was announced in the *Athenæum* that Professor Jacobi, of St. Petersburgh, had discovered a method of converting any line, however fine, if engraved on copper, into a relief by a galvanic process. This announcement was followed by a letter from Mr. J. C. Jordan, which appeared in the *Mechanics' Magazine* in June of the same year: and it is due to Mr. Jordan to state that the suggestions he then made have since been acted upon with considerable success. Mr. Robert Murray next discovered that if the surfaces of plaster casts and similar non-conducting bodies were covered with plumbago or black-lead, it was no longer necessary to use metallic moulds, which had hitherto proved the great barrier to the progress of the electrotype art. Chemists and artists were not slow in their endeavours to apply this newly-discovered process as a means of multiplying copies of engraved plates, both of copper and steel. In the latter case, an impression was taken from the steel-plate, by covering it with a sheet of tin-foil, and passing it through the printing-press. The result was a print obtained in relief on metal. Upon this a deposit of copper was made of the required thickness, and the required plate from which to print was obtained. In the early experiments the plates were thin, and curled in printing: this defect was, however, soon overcome, and the practice of engraving in copper, where large plates were to be produced, as in the examples issued by the Art Union, was again soon reverted to, thus affording facilities which are now largely availed of, for multiplying copies of costly engravings at the same time that the quality of the works produced can be maintained against wear.

Glyphography.—The next application of the electrotype art to which it is necessary to refer was that patented by Mr. Edward Palmer, and introduced under the title of "glyphography, or engraved drawings for printing at the type press after the manner of woodcuts." The process was a compound of drawing and engraving on a plate of copper, the surface of which, having been stained black, was then covered with a thin layer of a white opaque composition. A tracing of the design to be drawn or engraved was made. Needles, of various degrees of breadth and form, were then employed to remove the composition from the surface of the copper, beginning with the greatest breadths of shadow, and gradually working up to the lighter and more delicate parts of the design. When finished, an electro deposit was taken from the drawing so made, and a block in relief was thus obtained, which, being mounted in the same manner as an ordinary stereotype plate, was capable of being worked in with the type and printed from in the machine and steam-printing press. It is necessary to state that the composition on the face of the plate was extremely thin, and in order to obtain the required relief for a printing block, recourse was had to a secondary process for increasing the amount of relief in the blocks, and this was done to any desired extent. The specimens which Mr. Palmer presented to the world, of work produced by this process, left little to be desired so far as artistic effect was concerned; but as the process has not become general, I fear the cost of producing the blocks was not commercially economic. Among the artists who first applied this process may be mentioned Thomas Landseer, J. Bateman, W. S. Wilkinson, Alfred Crowquill, J. Fraser Redgrave, and W. H. Pain. This process is not so generally known as its merits and capabilities entitle it to be, and the problem of how to obtain with facility a substitute for the wood block still remains unsolved. Among the numerous other plans proposed for use in the production of engraved plates or blocks, may be mentioned Voltatype, eletro-tint, Dagnerreotype, and etching by galvanism.

(To be continued.)

Proceedings of Societies.

South London Photographic Society.

The usual monthly meeting was held on the evening of Thursday, Feb. 9th, Mr. **Sebastian Davies** in the chair. The minutes of a previous meeting having been read, the following gentlemen were elected members of the Society:—Messrs J. Werge, Falshaw, and Baldwin.

Mr. **Aldis** exhibited a very excellent enlarged print on plain paper, enlarged from a card negative on to a whole sheet of paper by means of the lime light and solar camera. The exposure was two minutes development, being effected with gallic-acid in the usual way.

Mr. H. P. **Robinson** produced an old printing frame with a print of a piece of lace and feathers, which possessed the interest of being one of the earliest ever used in photography. He said,—

The printing frame I exhibit is not of any practical importance, I merely bring it before you as a photographic curiosity, and to my mind a very interesting one. It was one of the first made for what was then called photogenic drawing, and was purchased in April, 1839, two months after Mr. Fox Talbot made his first announcement of the discovery of photography at the Royal Society—by Dr. Diamond, who is now one of the oldest photographers living, and to whom the art owes more—not only in experimental research and skilful practice, but in the ever-ready courtesy with which he imparted his knowledge on the subject without the slightest reservation or endeavour to obtain any private or personal advantage—than to any other single person. I believe I make no error in stating that Dr. Diamond was the first instructor of many of the most enthusiastic and skilful photographers, amongst whom were Earl Stanhope, Sir John Watson Gordon, Dr. Mansell, the Count de Montizon, Baron de Forrester, Messrs. Lake Price, Mayall, and Shadbolt, Professor Farraday, and a great many others. For myself, I shall always be grateful to him for introducing me to the art, and smoothing over the difficulties I met with in my early practice. He perfected the first invention, Calotype; and had it not been for the assistance he gave to Archer, I do not hesitate to say the introduction of the collodion process would have been delayed for years.

The paper for the print enclosed in the frame, of some lace and feathers, was prepared by brushing the paper over with a solution of common salt, and, when dry, with a solution of nitrate of silver. It was fixed with bromide of potassium. At that time hyposulphite of soda had not come into use. It appears like a faded print now, but I believe the colour has not much altered.

On the back of the print is a copy from Dr. Diamond's diary of the time; in which is written, "April 8, 1839. Bought some photogenic paper. April 9. Made a first attempt at photogenic drawing (which is the picture I now write on)."

The printing frame was examined with considerable interest by the members.

Mr. Wharton Simpson said he thought the print in the frame exhibited had a further interest besides its antiquity. Although taken five and twenty years ago, he believed it was precisely in the same condition to-day as on the day when it was taken. He remembered Dr. Diamond calling his attention to the print a few years ago, and no change had taken place since that time. The peculiar colour it possessed was due to the process, and not to fading. He did not remember to have seen a faded print by Dr. Diamond by any process, a fact which shewed how much skill, intelligence, and care might do to guard against this reproach to photography.

Mr. Harmer said he commenced his photographic studies about the same time, and he remembered the character of the prints. He had no hesitation in saying that the print was just in the same state as when first produced.

Mr. W. Warwick King, referring to the aid given to early photographers, expressed his conviction that few men were more capable of aiding it, both from his high accomplishment in the art, and his freedom from that mercenary spirit with which of late years the art had been cursed. Whatever Dr. Diamond discovered in his extensive researches was at once given to the public free from the trammels of patent. Photographers owed a large debt of gratitude to such men, who so ungrudgingly placed their stores of practical experience at the service of others.

The Chairman said his own first attempts in the collodion process were from the written instructions of Dr. Diamond, the formula being that published in a journal at one time much read by photographers; he referred to *Notes and Queries.* The collodion was sensitized by means of iodide of silver precipitated from the nitrate by iodide of potassium, and then redissolved in a solution of iodide of potassium. That collodion was quite as sensitive he thought as any made at the present time, although it probably lacked a little of the half-tone, and some other qualities obtained by the use of bromides. He had much pleasure in moving a vote of thanks to Dr. Diamond and Mr. Robinson. The motion was carried by acclamation.

Mr. Simpson exhibited some of Mr. Mudd's recent landscapes on plates 20 inches by 16 inches, and on plates 7 inches by 4½ inches. He remarked that it used to be a general opinion that the highest degree of delicacy, softness, and atmosphere were incompatible with dry-plate photography; but he thought that these pictures by the collodio-albumen process could compete for every good photographic quality with the finest ever taken by the wet process. As artistic studies, he had rarely seen anything so fine as these. The skilful manipulation in producing cloud effects was especially worthy of attention, its success proving its legitimacy. The large ones were, he believed, by a single lens, and the small by the No. 1 achromatic triple.

The prints were examined, and excited much admiration.

The Chairman remarked that it was somewhat singular that these pictures which they had been examining with so much pleasure, the finest almost they had ever seen, were by the first dry process discovered. Mr. Mudd had steadily adhered to it, giving it much attention and perseverance, and the charming prints before them were amongst the results. At an early period he had himself practised the collodio-albumen process, and found it capable of the very best results, but for the one draw back of blisters. This Mr. Mudd appeared to have overcome. He believed Mr. Simpson had prevailed on Mr. Mudd to promise them some further particulars of the manipulations, which possibly might vary very slightly from what he had before published, and yet in the minutest variations the secret of success might lie. He had pleasure in moving a vote of thanks to Mr. Simpson and to Mr. Mudd for the sight of these charming pictures.

Mr. Howard, in seconding the vote of thanks said no one could look at these pictures without admiring the artistic qualities, the perfect balance and harmony of composition.

The thanks were carried by acclamation.

Mr. H. Cooper, junior, then read a paper on the "Wothlytype Process" (see p. 75), and exhibited a number of very fine and interesting specimens.

Mr. Cooper, in answer to a question, said the peculiar effect of deep blacks in the shadows, and a rosy tint in the half tones was due to the peculiar action of the toning and fixing bath of sulphocyanide of ammonium, in which the first toning took place in the half tones, which quickly became blue, whilst the deep shadows removed warm; and next, after longer immersion, the half tones became warm, whilst the deep shadows became black.

Mr. Wharton Simpson said that this was a peculiarity of the sulphocyanide toning bath, which deserved attention. In portraits it was often of vital importance to the artistic quality of the picture that the half tones should be warm, and here was a means of securing that effect at will.

Mr. H. P. Robinson said it was also often of equal importance to have the foreground warm, and the distance cold, and the same bath gave means of producing this.

Mr. Cooper mentioned also that prints toned in this bath, if removed in the first stage, became bluer on drying; but if allowed to remain until all the changes had taken place, there was no difference in the tint on drying.

The Chairman said that in all his experiments with the Wothlytype, he found a very great loss in toning and fixing. Indeed, the prints almost appeared to fade away.

Mr. Cooper had not met with such an effect for months, except in one or two instances. He found that the prints, when they first became wet in the acid bath, appeared to fade; he thought the appearance was due to the yellow tint, which deceived the eye. When the prints were subsequently placed in the toning bath they rapidly acquired depth and vigour.

Mr. Simpson said that he found the use of the bath of acetic acid and water indispensable to prevent this loss of depth. Prints immersed in the toning bath direct from the pressure frame frequently lost very much or disappeared altogether. How the acetic acid bath acted he could not say; but it certainly seemed to prevent this loss of depth.

The Chairman had tried with the acid as well as without, with the same result. He had also tried a piece of ordinary albumenized paper, coated with Wothlytype collodion, and then excited on a 30-grain bath. The effect in the pressure frame was very beautiful, possessing more vigour and detail than any other method would yield, but it was all lost in the toning and fixing bath.

A conversational discussion followed, in which Messrs. Cooper, King, Blanchard, Howard, Simpson and the Chairman took part. After a vote of thanks to Mr. Cooper,

Mr. Simpson, who was called upon to open the adjourned discussion, on streaks in the direction of the dip. He said that had he hoped to have something to say on the subject, and had experimented with that view, but unfortunately had been unable to produce the defect. He had on former occasions been, as doubtles many photographers had been, only too familiar with it; but it did not come when required.

Mr. King had, during the last summer, been much troubled in this way, and at the time thought it was the fault of the collodion. He thought however that Mr. Davis had treated the matter so fully that there was little room for further discussion. The great point was that Mr. Davis had furnished them with a remedy.

After some further conversation, Mr. Simpson said that in a conversation with Mr. Johnson (inventor of the Pantoscopic Camera), that gentleman pointed out the probability that the effect was due to the ether and alcohol, which escaping from the surface of the collodion film into a denser fluid, at once ascended in straight lines, forming little currents, preventing the perfect action of the solution during the time. He thought that the Chairman's remedy, and many other of the phenomena, all tended to confirm such a view.

The Chairman said that this view coincided with his own conclusions.

After some other remarks,

Mr. Blanchard said that this defect was more likely to take place with a new than with an old bath. He referred to a similar defect which very much resembled these streaks, but which arose from over-iodized collodion.

Mr. Simpson thought the latter could be distinguished by generally being in waved lines, not covering the entire plate. The streaks in the direction of the dip were generally quite straight, and from one end of the plate to the other.

In some conversational remarks which followed, the repellant condition of the collodion film at times was mentioned.

Mr. Blanchard said two or three drops of water to each ounce of collodion would generally cure that. Allusions had been made to the streaks being most frequent with a collodion which made the eyes smart in using it. This generally arose from a decomposed collodion, which was very slow indeed in setting, and probably arose from the surface being imperfectly set when immersed in the bath.

After some further conversation, in which Messrs. Howard, Blanchard, Robinson, King, Simpson, Coeper, Grant, Fitch and the Chairman took part, the subject dropped, and the proceedings terminated.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 15*th Feb*., 1865.

General Mangin has addressed to our photographic society the following letter upon the colouring of negatives for printing positives; together with some observations upon dry collodions, upon the influence of the time of day, and upon the action of ozone in connection with rapidity of exposure. He says:—

"In reading, in a recent number of the society's *Bulletin*, the remarks of M. Cassan on the subject of the employment of negatives coloured yellow, red, &c., after being developed, I could not help thinking of the number of delusions experimenters experience in consequence of the publication of ideas more or less specious, but which are, too frequently, only specious.

"Permit me then to communicate to you on this subject the result of some experiments I have made, about a year ago, with M. Duguet, chief engineer of roads and bridges at Chalons.

"Like M. Cassan, we had the idea of converting by colouring direct positives into sufficiently intense negatives. Let me commence by telling you that the result was far from being satisfactory; seeing that, if the negative was not intensified beforehand, the positive pictures obtained with the coloured negatives were no better than those obtained before it was coloured; in other words, it was nearly proved to us that a completely yellowed negative was not less impermeable to light than those obtained with the iron or pyrogallic acid developer.

"I have the honour of sending you three yellowed negatives, which I think will suffice to show you the inconveniences presented by this process, and which I shall proceed to describe to you.

"The negative No. 1 has been simply yellowed.

"The negative No. 2, after being yellowed, has been varnished hot, and, under the influence of heat, it has very nearly recovered its original colour, evidently in consequence of the decomposition of the iodide of mercury, and the vaporization of its two elements.

"The negative No. 3 has been varnished cold, and developed some opaque spots, which I am unable to account for; these spots always make their appearance when a yellowed negative is varnished cold.

"The process we practised has nothing new in it.

"After developing as usual, either with iron or with pyrogallic acid, we immerse the negative, after being sufficiently washed, into a bath of perchloride of mercury, of 1 or 2 per 100; after being immersed for a few moments, it is withdrawn and washed, it is then immersed in a bath of iodide of potassium, *previously saturated with iodide of mercury* (that is to say, into which a saturated solution of bichloride of mercury is slowly poured, until the vermilion red tint remains persistent; when filtered, it is ready for use); the negative yellows instantaneously; it is withdrawn at the expiration of a few moments, then washed and dried. This method succeeds equally well upon albumen and upon albumenized collodion. But I repeat that there are no real advantages to be derived from yellowed negatives.

"As I never occupy myself with photography except in connection with the aids this art may render to the military service, I have experimented chiefly with dry collodions, and I have arrived at what appears to me very curious results. In the first place, I do not know, and I have not yet met with, accelerators properly so called: thus, I have the honour of sending you an instantaneous proof of the *Procession de la Fête-Dieu sortant l'Eglise de Saint Martin a Laon*. The collodion film was torn in drying, leaving only the portion I now send to you.

"The negative has been obtained upon a plate simply collodionized and sensitized, according to the process described by M. Blanquart Evrard, in 1863, without the addition of any accelerator or preservative. I have employed Darlot's objectives, which are excellent, and are of 2 4-10ths of an inch diameter and 6 inches focus.

"Perhaps another observation will not be uninteresting to you; it is, that the hour of the day has a very considerable influence upon the photographic results. Thus, in the month of June last, five prepared plates, on the method described by M. Blanquart Evrard, were exposed by me, at mid-day, in a "guillotine" apparatus, giving only one-sixth of a second exposure. Two of these plates did not give the least trace of a picture upon being developed. The third plate, exposed at five o'clock in the afternoon, in the same apparatus, and *upon another view*, as the sun no longer shone upon the first, gave a very good result. The other two, exposed next morning, again with one-sixth of a second exposure, gave passable negatives, and I have repeated the experiment several times.

"It is singular that the hours of the maximum of rapidity appear to coincide with those of the maximum of ozone diffused in the atmosphere. Is this rapidity really due, as believed of late, to the presence of this gas? It is possible, nevertheless I doubt it; for about two years ago, when making experiments in an apparatus arranged so that the air contained in the camera could be supplanted by any other gas or vapour, ozone did not give me any appreciable results."

M. Piard has also addressed a note on this subject to the Society, he says:—"Thus far I have succeeded in producing only three colours, bright yellow, sea green, and orange red; that is to say, the colours which correspond with the three varieties of iodide of mercury, which partly form the picture in coloured negatives (sesqui-iodide $I^3 Hg^2$; proto-iodide $I Hg$; and biniodide $I^2 Hg$). But I think it will be easy to obtain other colours by converting the coating of metallic silver in ordinary negatives into an appropriate silver salt, and in making other salts which, acting upon the picture thus modified, produce coloured products by double decomposition.

Upon these communications, M. Davanne remarked that they seemed to contradict each other, and that it would be desirable to appoint a committee to examine the facts put forth by various authors on the subject of the colouring of negatives. The President thereupon namd MM. Davanne, Girard, and Perrier as members of the committee.

COPYRIGHT IN ENGRAVINGS.

Sir,—In addressing you on "copyright," my object was to show impartially how the question really stood, and what warranty the print publishers had for the method of conducting their business; and though inferentially it supported their views, my desire was to furnish data to assist in settling a question which has become so important that I cannot believe that it will remain much longer without some action on the part of the legislature. In my letter of the 30th ultimo, I alluded to two or three other points touched on by "Detector," and in his letter of the same date inserted, in The News of February 3rd, he has replied to mine in Jan. 27th, to which I take strong objection, as it deals with it purely as a question personal alone to the print publisher, and will shortly refer to his propositions.

I. Vice-Chancellor Kindersley has as yet given *no decision;* he has expressed *an opinion*, which *will probably receive the weight of a decision from him*, and whether from misconception, inadvertence, or cupidity, the publishers have forfeited their copyrights by printing and selling "artist's proofs" without a publication line; they must accept the situation if so laid down; but you will find that publishers are more anxious about their current publications than those gone by, and it is those prints which the copyists most desire to have; vide Gambart v. Gregg, at Birmingham, for a piracy of the "Derby Day;" query, why did not the defendant give up the name of the pirate in this instance?

II. If a print bears a publisher's name, it is primâ facie evidence of proprietorship, and there are but few prints which are not the bonâ fide property of those whose names are to the plate, and the addition of the word "proprietor" is the exception to the thousands of plates issued since Hogarth's time; and, *if necessary, that additional word would cure that defect:*—"Detector" lays great stress upon this point. I think little of the objection.

III. In regard to the finished proofs claimed as a right, and as specimens of his art, by the engraver, I distinctly deny that they form any consideration in lieu of any part of the renumeration for his work, or that the publisher admits the right to sell such proofs. Custom has sanctioned the practice of taking such proofs for years, and they were frecquently taken before delivering the plate, but now they are generally delivered to him by the puplisher; the majority of engravers would indignantly refuse to sell any of their proofs, and their dispersion by death, bankruptcy, or other means are accidents over which the publisher has no control. But "Detector" *omits* to state *the opinion* of the Vice-Chancellor, that such proofs being so sold, would *not* vitiate the publisher's copyright, and I expressed such an opinion in my letter.

IV. That because publishers deem it impolitic to adopt photography, can you, sir, reasonably support the doctrine, that their property, legally protected, by all that the Acts of Parliament require, is to be the prey of all who choose to copy them, and to run the chances of conviction under the present inefficient statutes? "Detector" seeks to lessen the value of precedents in the publishing trade, or to point out remedies for any errors, and omits any reference to the obviously mor honourable course, for photographers to take an independent position for their art, which I pointed out. But this question seems to be argued on a parallel with that of the counsel who held a brief for a defendant, with "no case, abuse the plaintiff," that is the publisher. I quote from the Acts of Parliament, 8 Geo. II. cap. 13,—"Whereas divers persons have, by their own genius, industry, pains, and expense, invented and engraved, or worked in mezzotinto, or chairo oscuro, sets of historical and other prints, *in hopes to have reaped the sole benefit of their labours:* and whereas print-sellers, and other persons, have of late, without the consent of the inventors, designers, and proprietors of such prints, frequently taken the liberty of copying, engraving, and publishing; or causing to be copied, engraved, and published, *base copies of such works, designs, and prints, to the very great prejudice and detriment of the inventors, &c.*" And "17 Geo. III. cap. 57, which refers to that of Geo. II. and 7 Geo. III., and then goes on to say:—"And whereas, the said Acts have not effectually answered the purposes for which they were intended, and it is necessary, *for the encouragement of artists, and for securing to them the property of and in their works, and for the advancement and improvement of the aforesaid arts,*" &c., to show what was evidently felt to be an evil in the early history of the English school of art and engraving, requiring the strong arm of the law to repress, and which is now more rampant than ever, when the interests of art are of a far more gigantic character, and putting aside all questions of whether the print-publishers have done right or wrong, I ask you, sir, to weigh the evidence dispassionately; and having done so, I confidently rely upon your valuable co-operation on the wider basis of securing such an alteration in the present Acts as will accurately define the rights of all parties concerned in the production of art in whatever form it may be issued, how such rights are to be acquired, and to provide a sharp, speedy, and inexpensive method of enforcing penalties on the persons of those who infringe such rights, and who seek to escape punishment under the plea of poverty? I will now conclude, and hope I have succeeded in stating the case.—

"Nothing extenuate, nor set down aught in malice."

I am, sir, yours obediently,

Feb. 7th, 1865. J. S. W.

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Photographic Notes and Queries.

Printing with Chlorized Collodion.

Sir,—I have just read the first paragraph under the heading "Talk in the Studio," of yesterday's issue, in which chloride in collodion is treated of; the idea of coating paper with chlorized collodion, and exciting on a silver bath, struck me some time ago on reading your process of "using the sensitive salt formed in the collodion without the use of a nitrate bath." I commenced to make several experiments, the result of which you will see from the enclosed photographs, selected from trials at various times and by different methods. I sensitized collodion with chloride of magnesium, and coated albumenized paper, allowing it to set for a second, then floated on a 30-grain silver bath for four or five minutes, until greasiness disappeared, then hung up to dry. My first experiment in toning was with phosphate of soda and gold, but the prints refused to tone. I next tried hyposulphate of soda and gold, but experienced the same difficulty as mentioned by Mr. Wenderoth. The enclosed mounted carte was done by the last method, and was more satisfactory than any of the others. I then tried toning with sulpho-cyanide of ammonium and gold, but did not succeed, as the two unmounted prints sent will show. One of the prints marked on the back, after being coated with collodion, was allowed to dry perfectly before floating. When printed, it possessed great vigour, and appeared perfectly faultless, and had a rich purple brown colour. But mark my astonishment on putting it into the toning bath, the image almost disappeared, apparently sinking into the paper, turning yellow, and refusing to take any other colour, even after prolonged immersion.

I did not intend to trouble you, at present, with the enclosed results of my experience, but as the subject has been brought forward, I thought that the above facts might be useful to some of your readers who might be wishful to try the process. I shall feel obliged by your giving it a place in your next impression.—I am, sir, respectfully yours, John Frew.

7, *Railway Terrace, North Shields,*
11th February, 1865.

P.S.—I fancy that paper sized with arrowroot will be more suitable than albumen for this process.

[The use of our collodio-chloride of silver process gives much better results, with less trouble, and at less cost, than the process of using simply chlorized collodion, which requires exciting on a silver bath in the usual way.—Ed.]

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Talk in the Studio.

Photography and Archæology.—At the meeting of the Archæological Institute, on 2nd Feb. instant, Mr. F. Bedford exhibited some beautiful photographs of the interior of the Beauchamp Chapel, in St. Mary's Church, Warwick. There were also on the table some large photographs of Maxstoke Castle, Warwick. M. Du Sommerard, Curator of Museum, at the Hotel Cluny, Paris, presented a set of photographs of the Gothic crowns, discovered a few years since in the north of Spain.

Photography in Colours.—Some of the foreign journals speak of this alleged discovery as a received fact. The last number of the *Revue Contemporaine*, has an article by Dr. H. Montucci, giving a detailed account of the last triumph of photographic art, due to the indefatigable researches of M. Chamboy, who has spent the last few years at Port Louis, Ile de France. M. Chamboy has succeeded in fixing the natural colours of the object photographed. The operation is as instantaneous as in ordinary cases, and, if the report be not exaggerated, the likeness obtained has all the delicate colouring of a pastel drawing, and the minute accuracy of miniature painting. The question arises whether a similar result can be obtained in our foggy climate. Dr. Montucci reminds his readers of the contrast between the marvellous clearness of the air in the southern hemispheres, when compared to even that of the finest summer day in Paris. This has been the grand difficulty which M. Niepce de St. Victor has so long struggled to overcome, in his photographic experiments, and with wonderful success, as M. Niepce has succeeded in fixing on his proofs not only reds, greens, yellows, and blues, but blacks and whites, which have been the most difficult to seize. M. Niepce has had recourse to a very high temperature, which unfortunately has a disastrous effect on all colours produced by light, giving them a tinge of red. When the proof is removed from the dark box, in which it has received the impression of the object to be photographed, the whites and blues have a peculiar delicacy of hue, which the process of fixing by heat unfortunately tarnishes. Dr. Moutucci does not appear to despair of M. Niepce's ultimate success.

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To Correspondents.

O. K. Walker.—The bad weather and press of engagements have prevented us completing the promised test until a few days ago. See an article in the present number.

R. M. A. desires to know the name of the photographer who copied the Victoria Cross Gallery, and if copies are to be had. Can any of our readers inform us?

W. G. Williams.—The iron printing processes have not been sufficiently tested to render the assurance of their permanency absolute. Where the final image consists of gold, as it does in some of the iron processes, the permanency is tolerably certain. 2. The first article on our process of printing with collodio-chloride of silver appeared in the News for October, 28th, there was another article in the number for November 18th, and the remainder have appeared this year.

Medicus.—The object of alkaline additions to chloride of gold is to produce neutrality, or something just beyond that, so as to facilitate the decomposition of the chloride and the precipitation of metallic gold. The presumed difference in the result of different formulæ arises from the degree of subdivision in which the gold is thrown down, the minuteness of the particles affecting the colour. No. 6 enclosed is a good colour, all the others are under-printed. It is difficult to establish a formula which shall succeed universally. Different samples of paper, and different kinds of negatives, often require slight variations, which experience only can suggest. Have you tried Mr. Heisch's formula?

G. R. P.—We should hesitate to use vulcanized india-rubber for lining a a bath in which hypo is kept for fixing paper prints, as it is difficult to get rid of the particles of free sulphur from the india-rubber. Why not try sheet india-rubber, which has not been vulcanized? That will answer perfectly.

Henry D. Atkinson, Liverpool.—The first formula you give is the ordinary acetate bath. It is by far the most commonly used of any amongst professional photographers, and generally gives admirable warm tones. The solution will keep well, and should not be used until it has been mixed 48 hours. The second formula is bad every way: the solution will not keep, and will probably rarely tone at all. The third is good if carefully used. It should be used about half an hour after mixing. The loss of half-tone is more probably the fault of the negative than of the toning bath. If you had sent us an example we could have judged better. The third bath will not keep. 2. You will save yourself much trouble in preparing pigment for the carbon process by purchasing that ready prepared by Newman or Reeves.

Georgius.—Mr. Haes' stereos are published by McLean and Haes, Haymarket.

F. J. K.—The simplest mode of making a print transparent, is to wax it, either by applying the wax melted, or by dissolving it in essential oil, like that of rosemary or lavender. Prints may also be made transparent with varnish.

Artist.—You would not infringe any patent by punching one image on a card into relief.

M. A.—Any quiet neutral tint is good for the studio, and by all means avoid varnished and reflecting surfaces, which are often mischievous. Have clear glass for the skylight, as there are times when you will require all the light you can get.

Pyro.—Mr. England uses several lenses for his stereoscopic pictures, varying the lens to suit the subject. We believe, in his Swiss views, he used single lenses, double lenses, and globe lenses. The definition in your picture is good: a little more exposure and less intensifying would have made it a good picture.

An Amateur.—We are not familiar with the camera described in the work to which you refer; but it is very probable it will answer the purpose. To enlarge 2 by 2½ to 8 by 10 with a lens of 6 inches focus, you will require the camera to extend about 30 inches, or a little more for convenience.

Wm. Henry.—The plan you propose for your glass-house is good. If your lens answers satisfactorily, don't change it. The chief disadvantage of using such a long focus is, the amount of thick atmosphere you must sometimes have between sitter and lens.

F. D.—The nature of the change produced by light on the sensitive plate in forming a latent image is unknown. Various theories have been propounded, but no satisfactory proofs offered. That there is a molecular disturbance is most probable, but there is no change of surface which is apparent either to the naked eye or to microscopic examination.

J. H. Redin.—We forwarded the letter.

Ellie.—Dr. Monckhoven does not use iodized paper for his enlargements. He "prints out" without development, using albumenized or plain paper. We do not know of any better formulæ than the two given in our Year-Book just issued, one by Mr. W. Woodbury, and the other by Mr. Sydney Smith. The prints we have seen by both are excellent.

M. G. Fawe.—Common water, unless it be very impure indeed, will answer for washing both negatives and prints. Candle-light, if brought very near a sensitive collodion film, will produce a fogging action.

Inquirer.—It is probable that the fault is in your nitrate of uranium, which is probably very acid. This would cause it to print slowly, and also to tone to the red tint. The suphocyanide does not seem a very pure sample, but we have had similar results with a pure sample, when the uranium contained much free nitric acid. Regarding our own process, we are still experimenting. Chloride of magnesium, or of strontium, or of calcium may be used.

C. X. S.—We have not tried it, and cannot say; but a perfectly neutralized, or slightly alkaline toning bath rarely keeps well without the presence of a trace of free chlorine. 2. The addition of chloride of calcium is said by Mr. Heisch—an able chemist and most trustworthy authority—to be valuable. 3. No. 1. You may procure the rules of Mr. Frauk Howard, No. 10, Lansdowne Road North, South Lambeth. 4. Use the solution of iodine and iodide of potassium we have often recommended. It will aid you to preserve clean shadows in intensifying. Divide a circle into eight equal parts by drawing four lines through it, each represents an angle of 45°.

G. B.—We are not aware that it has ever been done; but it is not a thing which could be registered. You can only register a design, a book, or a picture.

Vanni.—The stains on your background are caused either by dirty plates or imperfect manipulation, not from any fault of the collodion. Either, 1, 2, 3, or 8 is good.

Castleberg.—The triple will answer your purpose best for all the purposes you name. The person you name is a dealer, not a maker.

C. Harris.—We shall publish your letter in our next.

J. S., Bruges.—It is clear that if a gramme of chloride were used it could not be lack of gold. We can only suggest that you give the print insufficient time. The first of the bath is to turn the print of a foxy colour, and next to tone it properly. Probably, if you gave a longer time, the result would be all right. The discrepancies in the proportion of sulphocyanide to be used are rather apparent than real. The proportions are stated differently when for a different purpose. Some of those you quote are for Wothlytype or collodio-chloride prints, in which but 4 or 5 grains of nitrate of silver per ounce are employed, and others for albumenized paper with ten times that proportion of the silver salt. In the latter case, 1 part of sulphocyanide in 4 of water, is the weakest solution we think permissible.

A. P.—The optical centre of an ordinary view lens is about one-third from the back surface.

Received, the "American Photographic Almanac." A notice in our next.

Several articles and letters are compelled to stand over until our next.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Joseph Collings, Cardiff, Glamorganshire,
Photograph of Penarth Church.

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⁂ The Publisher respectfully requests that all remittances above 3s. may be made by Post-Office Orders, payable to Thomas Piper, at the Chief Office, St. Martin's-le-Grand. Sums below 3s. may be remitted in postage stamps.

All Communications for the Editor to be addressed to 32, Paternoster Row.

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THE PHOTOGRAPHIC NEWS.

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THE USE OF COLLODION IN PRINTING.

We have a few words to say on the use of collodion in printing, which, in a recent article in a contemporary, is regarded as bad in principle, dangerous in practice, and more costly in price than albumenized paper printing. The subject is an interesting and important one, and although the use of collodion in printing is not strictly new, having been before proposed by Mr. Sutton and others, it has not, until recently, ever been seriously contemplated on a scale calculated to supersede other methods of printing. A free ventilation of the subject is, therefore, desirable, and we shall have pleasure in aiding and giving publicity to the discussion. One word on its connection with our own collodio-chloride of silver process at the outset, in order to clear the way. Whatever may be our own views on the ultimate position of this process, we have never, to this moment, proposed it to supersede the present mode of printing. We have not patented it or protected it in any way. We have declined overtures to give especial previleges, aid, or sanction to, or receive commission from, any firm manufacturing the prepared collodion. The process, whatever its value, is placed freely at the service of photographers, and the preparation of the materials is open to everyone, our aid and advice in securing the best results being equally at the service of all. We simply make these personal explanations, and get rid of them as quickly as possible, in order to remove any idea from the minds of those who look for interested motives, that we can have any personal motive for recommending the use of collodion in printing, and to invite free communication on either side of the question. We are uncertain at present on which side the balance of advantages lies. We know something practically of the faults and good qualities of albumenized paper; full discussion and considerably extended experience alone can aid us in arriving at the same certainty regarding collodion. But as very naturally, and very properly, vested interests are concerned in defending albumenized paper, we fear that few persons will be equally concerned in advocating its new competitor. Without assuming the position of a partizan, we shall, therefore, point out the fallacies in our contemporary's attack on collodion printing processes, and the misinformation upon which some of them are based.

We have another remark to make before entering upon the discussion of the main question. The editor of the *Notes* deprecates experiment in these processes as a "reprehensible kind of dissipation, in which money and time are wasted, and no good results achieved." Now our able contemporary knows very well, as a logician, the weakness of his *petitio principii:* by saying that no good result is achieved, he begs the whole question. Even if his subsequent remarks on the greater cost, &c., of the process were true, it would in no sense militate against the value of experiment in this direction. The province of science in such case is to discover new possibilities; it is the province of commerce to ascertain how these possibilities are practically available and profitable. In our early experiments with chloride of silver in collodion, we were solely concerned to discover certain possibilities: we have since been occupied in applying these possibilities, and as we think we can very easily show, to great advantage. But we wish especially to impress upon the minds of our experimental readers that no field for enquiry, research, and experiment is more legitimate than that of positive printing, and that every new possibility in that direction is well worthy of careful consideration and experiment. Let them avoid vague and aimless experiment without an idea, by all means, but let them not be deterred from following out experiments in a scientific manner, however devoid of economic results they may at first appear. We may, without impropriety, here quote a writer whose remarks have not been many hours published. Speaking of science, he says:—"She is like a kind mother; she shows us something which at first seems a mere plaything, but she puts it aside for us till we learn what it means and what it is worth. Nothing in her full hands is useless; the toy of the chemist or natural philosopher to-day is to-morrow the key to new civilisations; an accident occurs, a chance, a fancy, and by means of them she has suddenly and silently blessed the world. Boys at play gave Galileo his telescope; a wife's busy fingers knitting suggested the stocking-loom; Newton's apple, Watts's kettle, Wheatstone's electric doll, were the first of a formula that embraces all forces, of a power that does the business of the world, and of a mode of converse which makes Ariel a laggard."

For the sake of order we will take our contemporary's objection to the *principle* first, he says: "It is generally agreed that the material of the print should be kept as much as possible upon the surface of the paper Does collodion do this better than albumen? Certainly not. The material with which paper is sized is such as to render it comparatively impervious to water, aqueous solutions and albumen; but not at all to spirituous solutions." We may, in passing point out that there is something very loose and general in talking of the "material with which paper is sized." This "material" is in some papers gelatine or animal size, in others starch, and in others resin soap. The latter is probably more readily affected with alcoholic than with aqueous solutions, but it is very doubtful whether such would be the case with a paper sized with gelatine. But without entering into speculative considerations, we have simply to state that with so far as it regards our collodio-chloride process, the assumption that the collodion sinks *into* the paper, and that the image is formed there, is altogether erroneous. In some few instances on removing the film, we have found very faint traces of an image on the surface of the paper; but in the majority of cases we have examined, *the image is entirely in the collodion film*, and this is the case with papers prepared or unprepared before coating with the collodion. In the Wothlytype process, it is true, the image is in the paper: but a little reflection will explain the difference in this respect in the two processes. In the Wothlytype process the sensitive salts are in solution in the ether and alcohol, and when these fluids penetrate the paper they carry with them a portion of the salt they hold in solution. But in our process the chloride of silver is in suspension in the collodion, in such infinitessimally small particles it is true, that they produce no appearance of turbidity: the collodion being about as clear by transmitted light as opal glass, to which, both by reflected and transmitted light, it is very similar, having a milky white effect by the former, and something of an orange tint by the latter. These particles held in suspension by the glutinous body in which they are formed by precipitation, remain on the surface of the paper on which they are poured, embedded in the film of collodion. If there be a large excess of free nitrate in solution in the collodion, it is probable that a portion of this may sink into the paper, and it has been in such cases that we have found a very faint trace of an image on removing the film; but with a suitably prepared sample of collodio-chloride and a good hard sized paper, we have no hesitation in saying that the image will be retained entire in the collodion film, and will not be embedded in the paper at all.

Let us next consider the question of practice. It would be a tedious task to enter into a comparative estimate of the various manipulations in each process; but we may state generally that we believe those of the collodio-chloride process to be decidedly simpler, and requiring much less time than those of albumenized paper printing. Our contemporary states that the collodionized papers require longer exposure than albumenized paper. Never was a greater error. Those who have worked the Wothlytype process declare, unhesitatingly, that it requires shorter exposure. The printers of the patentees assure us that it requires very much shorter exposure. But it may be rejoined that they are interested. Mr. Cooper, whose skill all who have seen his work will readily admit, is a wealthy amateur, with no interest in the case but that of truth, and he bears similar testimony. In our process we know that very much less exposure than albumenized paper is required. Our esteemed correspondent, the "Photographer's Assistant," who, in his daily practice, has ample means of comparative estimate, in a letter accompanying a batch of excellent collodio-chloride prints, just received, says the exposure is half that of albumenized paper. That it should be so, may readily be conceived, when it is remembered that the sensitive salts are in an attenuated layer on the film, rather than in a layer of eight or ten times the bulk imbedded in the paper.

The question of practice, upon which our contemporary places the greatest stress is the danger to be incurred from inhaling the vapour of ether and alcohol in coating paper. The subject is a very important one, deserving the fullest consideration, and the editor of the *Notes* has done well in bringing it forward. As we have devoted another article entirely to its consideration, we shall simply remark here that all the observations on the subject apply equally to their danger in the ordinary dark room. The detrimental effect of these vapours has not received the attention which it deserves, and it is probable that to the introduction of collodion into printing processes that photographers will be indebted for the simple and efficient means whereby these dangers may be altogether obviated.

Regarding the question of cost, it is a somewhat difficult task to compare new and comparatively untried processes with those which have been extensively practised on a commercial scale for many years, and in the ingeniously tabulated comparative view of the cost of Wothlytype and albumenized paper printing by our able *collaborateur*, Dr. Vogel, which will be found on another page, we think that he somewhat underestimates the cost of the latter, and overestimates the cost of the former. In our collodio-chloride process we believe a sheet of paper ready for the printing frame will cost about half as much as a sheet of albumenized paper in the same state.

It is by no means necessary that the paper should receive a preliminary coating of any kind, the amount of silver employed does not average one-eighth or one-tenth of the amount necessary for albumenized paper, and suitable collodion can be made at a very cheap rate indeed.

We shall simply add one or two remarks on the special advantages our process possesses over the systems at present in use.

It is simpler in manipulation.

It is more perfect in principle, as a preparation of constant and known strength is used instead of one which varies with every sheet of paper prepared.

It is more sensitive.

The image is entirely in the film of collodion.

There is most perfect control over a wide range of effects, from extreme softness to extreme vigour, with the same negative, and great range in the character of the surface produced.

There is no silver in the whites of the finished prints, as there is in albumenized paper, and a consequent greater chance of permanency.

We will conclude by our answer to a question recently asked by a practical photographer interested in our process, and pleased with the results: "Would you," he said, "if you were a practical photographer, give up albumenized paper, and adopt your own mode of printing commercially?" Our answer was strictly impartial. We said, "Most probably not at present; we should require further experience with it before we adopted such a sweeping course. But, as an amateur, producing prints for our own use, it is probable that we shall constantly employ the collodio-chloride." We are anxious not to mislead our readers, and in our answer to one person, they have our general advice to all.

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THE TOXICAL EFFECTS OF ETHER AND ALCOHOL.

Incidentally arising out of the discussion as to the use of collodion in printing is a question of much wider importance, upon which the editor of the *Notes* lays great stress, and we thank him for bringing it forward in a very tangible shape. It consists in the danger arising from the inhalation of the vapours of ether and alcohol during the process of coating paper (and glass plates also, of course), with collodion. The toxical effects of ether and alcohol have probably been too little considered by photographers, and too little attention has been given to the precautionary measures clearly desirable. As it is probable that many of our readers may not see the *Notes*, we gladly give increased currency to the startling extracts it gives from Dr. Taylor's work on "Poisons," which are well calculated, as they are intended, to deter photographers from unnecessary contact with the dangers indicated. We give the same extracts which are given in the *Notes*, merely introducing some stars between the passages detached from various parts of Dr. Taylor's book, which read in the *Notes* as continued quotations.

"Ether Vapour.—It has been long known that the vapour of ether acts on the brain and nervous system like a powerful narcotic. Orfila mentions the case of a young man who was thrown into a state of insensibility through respiring ether vapour, and he would have died but for the application of proper means for his recovery. *Dr. Christison quotes a case in which a female was found lying in her bed quite dead, in consequence of her having respired during the night an atmosphere strongly charged with ether vapour.* * * * The poisonous effects of this vapour have been known for a long time. * * * When respired it enters the blood in the pulmonary vessels, and the effects are almost imme-

> diato. The person falls into a lethargic condition, the breathing becomes slow, deep, and stertorous, the skin pale and cold, the face livid, the lips assume a darker hue, the pulse is quickened, the eye is glassy, and the pupil dilated and fixed. * * * *Half an ounce of ether, or even less, inhaled in the form of vapour, would produce a much more powerful effect on the system then one or two ounces taken into the stomach as a liquid.* * * * Dr. Bigelow found that a young man who respired ether vapour for thirty-five minutes nearly sank under the effects. * * * Facts show that the respiration of ether vapour for so short a period as ten minutes may be attended with fatal consequences. * * * In any case the inhalation of the vapour must be looked upon as temporary poisoning."
>
> "Alcohol may act as a poison by its *vapour*. If the concentrated vapour be respired it will produce the usual effects of intoxication. * * * When alcohol has been taken for a long time, in the shape of intoxicating drinks, the person suffers from a series of diseases, the character of which are well marked. The usual effects are irritation of the stomach and intestines, nausea, vomiting, purging, jaundice, cerebral conjestion, schirrus of the stomach, dropsy, diabetes, paralysis, delirium tremens, and insanity. Such persons are subject to sudden death by coma. After death morbid changes are discovered in various organs; and the liver is especially affected. This organ is commonly enlarged, and of a lighter colour than natural; it is called the nutmeg-liver, or the drunkard's liver. In the body of a drunkard, examined twenty-four hours after death, Dr. Albers found the convolutions of the brain of a pale yellow hue; the lateral ventrical full of air; and the cerebral substance unusually tough. * * * The brain smelt like must, &c."

As we have said, these extracts are startling enough, and the first reflection of the photographer will be to the effect that, if these statements be true, the dangers indicated are attendant, only in less degree, on their negative practice than they would be printing practice, and the assistant operator in a large establishment, whose duty it is to do little else than coat plates and remain, with closed doors and windows, in the dark room during a long summer day, will begin to fancy that he ought to have been dead long ago, and that he violates all physical law by continuing to live. Without badinage, the case is serious enough; but it is not quite so serious as our contemporary would suggest. It is serious enough to demand consideration and care; but not so serious as to be irremediable with care.

In the first place it must be observed that Dr. Taylor is speaking chiefly of "ether vapour," and not of an atmosphere in which some portion of this vapour is diffused. In one case, it is true he refers to death resulting from breathing all night such an atmosphere; but it was "strongly charged with ether vapour," and in illustration of the fact that it is breathing the vapour itself to which the risk is attached, we may quote another passage in which speaking of these fatal results in using ether as an anæsthetic, he says: "in order to prevent this it has been advised to allow the patient to breathe the air occasionally, and to alternate the respiration of pure air with that of the vapour."

But another important consideration is to be borne in mind: in the case which we have cited, a strong dose has been taken by persons altogether unaccustomed to the agent in question. It is fortunate for photographers that another beneficent provision of nature operates in their behalf; we mean that capability of the system to accomodate itself to, and resist the influence of, agencies averse to health. Dr. Taylor refers to that as the influence of *habit*. He says, "It is well known that habit diminishes the effect of certain poisons," and he mentions amongst those "tobacco, alcohol, ether, chloroform" and others. Further on, speaking in detail, he says:

> Ether, like alcohol, is influenced by habit, and when used medicinally, it may, after some time, be taken with impunity in large doses. Dr. Christison relates the case of a man, at sixty, labouring under asthma, who, by a gradual increase of dose, was enabled to take every eight or ten days sixteen ounces of ether, and he had continued this practice for many years without any impairment of health. Dr. Pereira states that a man labouring under disease of the intestines, took, before his death, a pint of ether to relieve pain.

Regarding the influence of habit in modifying the action of the vapour of alcohol, he says, in continuation of the first sentence quoted in the *Notes*:—

> It is generally known that persons who have been *for the first time* employed in bottling spirits are easily intoxicated by the alcoholic vapour.

Dr. Taylor further adds regarding ether vapour:—

> "In any case the inhalation of this vapour must be looked upon as temporary poisoning, with, cæteris paribus, a better chance of recovery than exists in most other instances of aërial poisoning."

Now, we have no disposition whatever to make light of any danger to human life or to health, and although a complete statement of Dr. Taylor's observations on the toxical effects of these vapours presents a less appalling view of the case than a partial selection of passages, yet at best it is bad enough to demand much more serious consideration than it has yet received amongst photographers. As we have before said, the injurious influence of substances evolving these vapours when applied to printing, is only greater in degree, and not in kind, than when employed in producing negatives. And not always that; as an assistant operator employed in the dark room all day, coating plates, a circumstance of common occurrence in large establishments during fine weather, is subjected much more seriously to the action of this vapour than a person engaged for one hour in the morning in coating from a dozen to twenty whole sheets of paper, sufficient for a tolerably good day's printing in card pictures.

It is quite certain that in the construction of dark rooms this question has not received sufficient attention. Efficient ventilation of any kind is too little considered, and probably until collodion was employed in printing, ventilation of the right kind had never been thought of. Luckily, accident if we are not mistaken, has called attention to a plan by which the danger from the vapour of ether may be nearly or altogether removed. It is well known that the vapour of ether is very heavy, and at once falls to the ground; it is only necessary therefore to have a down draft for ventilating purposes in the dark room to render this danger nugatory at once. Our attention was called to this fact, which is so accordant with theory, on this wise. Several able practical photographers, who had spent some hours in visiting the establishment of the United Association, mentioned to us their surprise that in the room in which whole sheets of paper were coated with collodion and hung up to dry, there was scarcely a perceptible smell of ether; one of these gentlemen set himself to search for the cause, and soon found it in the fact that the chamber was reached by a steep staircase or ladder, down which there was a strong draft, and as the vapour of ether fell, it was rapidly carried off by this down draft, so as to be scarcely appreciable in the atmosphere breathed by persons in the room. We have been able since to fully confirm this experience. We have been more that once in the room whilst paper was being coated, other sheets being hung around to dry, and the smell of ether has been less apparent than in an ordinary dark room where negatives were produced.

Here, then, is an important hint for the preservation of health amongst photographers. An eminently practical photographer who is just building one of the handsomest photographic establishments in the kingdom, informed us, a few days ago, that, acting upon this hint, he was having a ventilating chamber constructed underneath his new dark room for negatives, in the floor of which would be grates or perforations to allow the ether vapour to pass through. He anticipates especial advantage from this in preparing dry plates, a process which frequently involves the necessity of remaining in the dark room charged with ether vapours for an hour or two without opening the door or securing any ordinary ventilation at all, any change of temperature being fatal, often, to regular drying.

It is unnecessary to dwell on the fact, now made so apparent, that with these proper precautions there need be absolutely less danger in the use of collodion for printing than is common in almost every dark room for negative purposes only. But we dwell on the more important part of the question and conjure our readers to give attention to the injurious and lowering action of ether upon the system, not for the purpose of avoiding the use of collodion—that they cannot do—but with a view to putting into practice those simple and efficient precautions so easily adopted and so important to employ. Health is a boon too precious to be lightly risked, and it is the act of a madman or an idiot to throw away a chance of securing it without equivalent of any kind whatever.

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DR. VOGEL'S METHOD OF TESTING SILVER SOLUTIONS.

We call the attention of our readers to a communication on another page from our esteemed contributor Dr. Hermann Vogel, on a new method of testing silver solutions. The usual volumetric method of Gay Lussac, in which the silver is precipitated as a chloride, is in many respects very accurate and satisfactory; but it possesses the drawback that, under most circumstances, it is very difficult, without extreme care, to determine the precise point at which precipitation ceases. Dr. Vogel has devised a method in which the same principle is involved, and the same accuracy obtained, but in which it is easy to determine a precise point at which precipitation ceases, the eye having to detect not simply the appearance of fresh turbidity in a solution, still slightly turbid, or opalescent from the last addition of the precipitant, but a bright blue tint, which is seen the moment that all the silver is thrown down. The silver is precipitated from the solution as an iodide, by means of iodide of potassium. The colour is dependent upon a peculiar action of nitrous acid on iodide of potassium in the presence of starch, the acid liberating iodine, which at once produces the blue colour by its action on starch. A mixture of starch with nitric acid, containing a trace of nitrous acid, is added to the silver solution to be tested, and the precipitation is produced by a standard solution of iodide of potassium. This goes on steadily in the usual way, produced a yellow precipitate, the solution becoming, in the mean time, blue from the action on the starch of the iodine liberated by the nitrous acid. A slight agitation causes the blue colour to disappear, the fluid having then a yellow tint, but the moment that the last trace of silver is precipitated, the blue colour becomes permanent, no amount of agitation removing it. For details of the operation we refer our readers to the article itself.

Dr. Vogel especially desires us to call the attention of English photographers to one feature in the operation, in order to prevent the propagation of error. The process was originally described at a meeting of the Berlin Photographic Society, and reported in the *Mittheilungen*. From this journal it was translated (without acknowledgment of that source by the way) by an English contemporary a week or two ago. But it so happens that this paper, and the English translation to which we refer, contain an important error. Dr. Vogel, in his early experiments, used, with the starch and iodide of potassium, persulphate of iron, to the action of which he attributed the peculiar result in his test, and in the first article on the subject in the *Mittheilungen*, this salt was given in describing the process. Subsequently he discovered that it was due to the nitrous acids to be found in most of salts of the peroxide of iron, and that in some samples of the persulphate, free from nitrous acid, *no such result would take place*. Dr. Vogel having seen this translation propagating the error, writes to ask us, when we publish his communication, which we had had already in hand, to call especial attention to the source of error in question, that it may be avoided. We subjoin an extract from his letter:—

"You will find some important differences between the translated article which has just appeared in your contemporary, and the paper already sent to you. In the paper taken from the *Mittheilungen*, *persulphate of iron* is proposed as indicator. I have used this at first, and proposed it in my first paper on the subject; but for some time past, I have made the discovery that it is *not* the iron salt which produces the effect of liberating the iodine from its combination with potassium, but the nitrous acid (NO_3), which you will find, in most cases, in the peroxide salts of iron, arising from the mode of preparation, generally by boiling solutions of protoxide with nitric acid. Peroxide salts of iron, *free* from NO_3, do not produce the effect. Having found this fact, I exchanged the iron salt for nitric acid, containing NO_3, as it is described in my paper, which you have in hand. I beg of you to call the attention of your readers to this point, for avoiding errors. N.B. The most simple method of making a clear solution of starch necessary for my method of testing silver solutions is to take a little arrowroot and boil it with water in a test tube.

"Mr. Trübner, of St. Dunstan's Hill, will keep in stock the apparatus and the necessary solutions."

We may add that a slight modification of Mr. Hart's very neat and compact volumetric apparatus may be made available for the same purpose.

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HERR WOTHLY'S FORMULA FOR NEGATIVES.

The exceedingly fine quality of Herr Wothly's negatives, from which the first specimens of his uranium prints exhibited in this country were produced, has been a common subject of remark. These negatives, some of which we have subsequently seen, and which are very brilliant yet full of gradation, are developed with iron only. In development we understand Herr Wothly will sometimes occupy fine minutes, without any fear of iron producing any deposit on the shadows. As will be seen in the details which follow, for which we are indebted to the courtesy of Col. Stuart Wortley, there is no especial novelty; but the formulæ throughout seem good, and evince an intelligent appreciation of the result to be accomplished. The only short coming is the absence of any formula for the preparation of the pyroxyline; but we may remark that the cotton prepared after the instructions in our Year Book, would work well in the process given.

The Collodion.

"In 4 lbs of alcohol of from 90 to 95 per cent., dissolve 680 grains of iodide of ammonium, 240 grains of bromide of cadmium, and 120 grains iodide of cadmium.

"To the solutton add 5 lbs of absolute ether, and 2¾ ounces of pyroxyline, and agitate until the cotton is dissolved; then add 1 drachm of distilled water, and leave the whole to stand a few days to settle. This collodion is very sensitive, and may be kept for some months without loss of sensitivness.

"A common fault in the manufacture of collodion is the addition of too small a proportion of pyroxyline, and the collodion is consequently too thin, and this is the reason that the negatives do not readily acquire sufficient density. By adding a little cotton to a thin collodion, the photographer may readily ascertain its importance in conferring vigour on the negative. It may happen that even collodion prepared after my receipt does not produce the desired effect, in which case a further addition of pyroxyline is necessary, containing the addition until the desired result is obtained. I own, therefore, that it is not possible to state the unfailing proportion of pyroxyline from the slight variations which exist in its quality. We have the means, however, of correction by making additions until sufficient strength in the negative is gained.

"The proportion of ether and alcohol must not, however, be changed, as a larger proportion of alcohol, for instance, would tend to produce weak pictures. Thick collodion has beside the advantage of securing on defective plates good negatives. The collodion should be poured slowly and quietly on the plate in order to produce an even, thick, and perfect film, a condition of the first importance in securing a clean and perfect negative. It is important for this and all photographic operations that the temperature of the laboratory should be kept at about 15° or 16° Reaumur, any deviation from this will interfere with the production of good negatives.

Preparation of the Silver Bath.

"Dissolve 1 lb. of double crystallized nitrate of silver in 12 lbs of distilled water. Next, dissolve 5 or 6 grains of iodide of ammonium in 1 oz. of distilled water. Add this to the silver solution and agitate; the turbidity caused at first will disappear in an hour and the solution will become clear. When clear, *but not sooner*, the silver bath must be carefully filtered. Now add to it from 10 to 15 drops of chemically pure nitric acid. It is very important to add the acid in the order above mentioned, after the iodide of ammonium has been added and the solution filtered, as otherwise a larger proportion of iodide of silver will be dissolved than is neceessary to the satisfactory working of the bath; in which case a larger proportion of nitric acid will be necessary to avoid any tendency to fog or mistiness, and this will sometimes cause the film to leave the plate. Any addition of acetic acid to the bath is not to be recommended as it diminishes the sensitiveness.

"When, after a lengthened use, the silver bath no longer produces the desired result, from the accumulation of double salts, iodide of silver, &c., dilute it with half its bulk of distilled water, and after allowing the precipitated iodide of silver to settle for a few days, filter it, then evaporate on a water bath to its original bulk—this removes ether and alcohol as well as water—again filter and add a few drops of nitric acid and a small quantity of a saturated silver solution, and the bath will be again ready for use. Should there be any tendency to fog add a little more nitric acid. It will have become obvious to the reader by the above remarks that an acid reaction in the bath, sufficient to turn litmus paper red, is desirable. The presence of large quantities of ether and alcohol produces streaks and stains, and the evaporation is valuable in removing these bodies.

Developing Solution.

"First prepare a *perfectly saturated solution* of sulphate of iron in water, and filter. Of this, which may be kept prepared for many months, a large quantity being made at once, take 2 ounces and add to it 1 lb. of distilled water, and then add a quarter of an ounce of acetic acid and one ounce of alcohol. The use of a saturated solution of the sulphate of iron has the advantage not only that the developer is quickly and easily prepared from it, but it also acts more satisfactorily than a newly mixed solution, especially if the saturated solution have been exposed for some time to the sun. Cover the plate evenly and gently not to wash the silver solution off the part whereon the developer is poured. The image will appear slowly, gradually acquiring strength and harmony. When sufficiently intense wash and fix in hyposulphite of soda. Should the negative lack vigour, it should be strengthened in the following way:—When the image is perfectly brought out, pour off the developing solution and flood the plate carefully with the following solution:—

Nitrate of silver	½ ounce
Distilled water	1 lb.
Alcohol	1 ounce

"When this has been kept on the plate about a minute, and flows quite evenly, pour it off, and apply a fresh portion of the developer, repeating the operation if necessary until sufficient density is obtained, then wash and fix. The negatives for the Wothlytype should be more vigorous than those for albumenized paper."

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RELATIVE COST OF THE WOTHLYTYPE AND ALBUMENIZED PAPER PRINTING PROCESSES.

BY DR. HERMANN VOGEL.

No. 1. *Collodion.*

	s.	d.	s.	d.
8 pounds ether at 1s. 3d....	10	0		
4 „ alcohol at 9d.	3	0		
3 ounces cotton at 2s.	6	0		
	19	0		
This makes 1 pound or 16 ounces of plain collodion			1	7
No. 2. *Solution of Uranium and Silver Salts.*				
3 ounces nitrate of uranium	6	0		
6 „ alcohol	0	6½		
60 grains nitrate of silver	0	6½		
	7	1		
The ounce of this solution			0	9½
No. 3. *Uranized Collodion.*				
3 ounces No. 1	0	3¾		
1½ ounce No. 2	1	2¼		
	1	6		
The ounce uranized collodion			0	4
Now you will use for each sheet of Wothly paper (18 by 22) 600 grains of this collodion No. 3.				
One sheet of paper...	0	3		
600 grains collodion	0	5		
Each sheet of sensitized Wothly paper ...	0	8		
Each sheet of albumen paper	0	3¼		
According to Mr. Hardwich's experiments* and others, a sheet of albumen paper absorbs 30 grains of nitrate of silver.				
30 grains nitrate cost	0	3¼		
Summary.—One sheet of sensitized albumen paper	0	6½		
Thus Wothly sensitized paper costs more for each sheet			0	1½

[The prices assumed by our esteemed contributor scarcely agree with those in this country. Except in very large quantities, it would be impossible to buy methylated ether at one shilling and three pence per pound, whilst, on the other hand, methylated spirit can be purchased for much less than nine pence per pound. Except by the ream and purchased at a cheap rate, a sheet of albumenized paper, on the other hand, costs more than three pence farthing, and a sheet of plain paper for the Wothlytype may be prepared for less than three pence. Again, in the experiments of Mr. Spiller and many others, as much as fifty grains of nitrate of silver are used by each sheet of paper.—Ed.]

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ON A NEW METHOD OF TESTING PHOTOGRAPHIC SILVER SOLUTIONS.

BY DR. HERMANN VOGEL.

For a long time past photographers have used for testing silver solutions, what is termed an *Argentometer*, an instrument sinking deeper into the fluid, as the solution is less concentrated, and indicating the quantity of silver by the number of degrees on a scale fastened on the instrument. The use of such an argentometer is simple and easy, if its indications were trustworthy. But it is pretty well known that the indications of the apparatus are considerably affected by the alcohol, ether, acetic acid, and the various salts contained in the fluid, and for that reason the instrument becomes not only totally useless, but even injurious, because, by its wrong indications, it causes illusions and errors of every kind. To it often has happened that photographers, deceived by the false indications of their argentometer, accused the chemicals employed, until a chemical analysis revealed to them the real cause of their imperfect negatives and prints. For instance, a positive bath mixed up in the relation of 1 to 8, was, after a long use, tested by the argentometer, and always indicated 1 to 8, though its real concentration, proved by chemical analysis, was only 1 to 11.

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* Floating on a bath 60 grains to the ounce.

These experiences show the undeniable necessity of a sure method of testing silver solutions.

The common volumetric method of Gay Lussac, lastly proposed by Davanne, is not convenient for photographers, as the real termination of the reaction is not easily ascertained. Adding chromate of potash is an insufficient remedy, as it cannot be applied with acid solutions, which are chiefly used in photographic practice. Besides, this method has the great disadvantage, that by a small quantity of organic matter contained in the silver solution, which happens very often, the total precipitation of chloride of silver is hindered, and the result of the proof highly changed.

All these circumstances have induced me to search for a new method of testing silver solutions, which is as easy and sure as the common volumetric analysis by chloride of sodium in pure fluids, which will not be influenced by acids and organic matters contained in the solutions, and which indicates *the point of saturation* in a way so certain, that it may be used even by the least experienced operator.

At last I have succeeded in finding out a method, the extraordinary accuracy of which I have tested by more than 100 experiments.

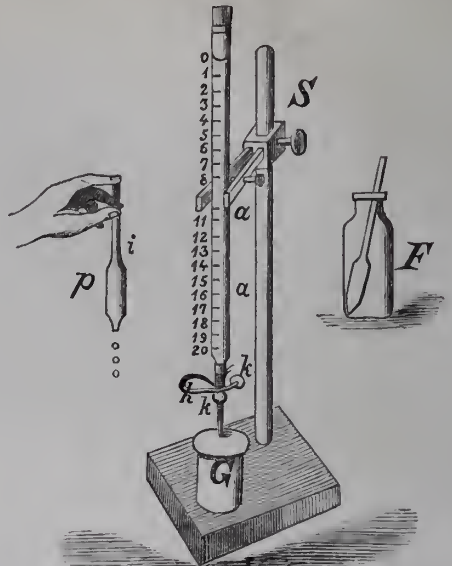
The principle on which the process depends, is a singular reaction of iodide of potassium on silver solutions on the one hand, and on nitrous acid, NO^3, on the other. By adding iodide of potassium to silver solutions, yellow iodide of silver is precipitated; by adding iodide of potassium to a composition of diluted starch, paste and nitric acid, containing a little nitrous acid, [*] immediately iodine is set free, which gives an intense blue tint to the fluid.

By adding a solution of iodide of potassium to a mixture of silver solution, nitric acid, and starch, both reactions will occur simultaneously; iodide of silver is precipitated and iodine set free, giving a blue tint to the fluid, because the latter contains starch. *But as long as the fluid contains free silver salts*, the blue tint will disappear by moving the vessel, and the fluid will become of a yellow tint. By adding, drop by drop, a greater quantity of iodide of potassium, at last the blue tint will no longer dissappear by shaking the fluid, and this is the point when all free silver salt is precipitated, the quantity of which is easily derived from the quantity of solution of iodide of potassium added to the silver solution. The point, when all silver salt is precipitated is to be seen with surprising accuracy, one drop of superfluous iodide of potassium being sufficient to give to the whole fluid an intense and lasting blue tint. If the fluid contains a greater quantity of iodide of silver, the blue tint changes into a *more green* one.

I now proceed to describe the method of using the apparatus destined for the testing of silver solutions.

First procure a solution of iodide of potassium, containing in 1023, 4 cubic centimetres of fluid, exactly 10 grammes of pure and dry iodide of potassium, 100 cubic centimetres of this solution will correspond to one gramme of nitrate of silver precipitated.

Now pour the solution cautiously into the burette of Mohr, *a*, (provided with a scale showing every 1-5th cubic centimetre) which you must hold in an inclined position, then fasten it to the support S, open the "pinch cock" of Mohr, *h*, by compressing its two buttons, *k*, *k*, and let the fluid escape till the under-side of the meniscus touches the 0 of the scale. The cock should be widely open, in order to remove the air or the rest of the old fluid, which may be in the little tube under the cock.



After that bring the pipette, *p*, completely cleaned with distilled water and precautionly dried inside, into the silver solution[*] to be tested, fill it by sucking at the upper end, close it quickly with the well-dried forefinger, take it out of the fluid, and by gently lifting the finger, let the fluid escape till its upper surface touches the point *i*, which is marked where the tube measures exactly 1 cubic centimetre. The fluid now contained in the pipette (1 cubic centimetre) let escape into the cleared vessel G, by leaning the pipette against the brim of it, otherwise you would not get the pipette totally emptied.

Then take from the bottle F, with a similar pipette, about 1 to 2 cubic centimetres of citric acid, according to the concentration of your silver solution. This poured too into the vessel G, by blowing on the upper end of the pipette, and then add to the fluid about 10 to 17 drops of a fresh solution of starch.

Now, to begin the testing, after having examined again the right height of fluid in the burette, *a*, take the vessel G, with the left hand, open cautiously the cock, and let fall some drops into the vessel. If the solution be concentrated, at first only yellow precipitate will be seen, afterwards a blue tint; but if the fluid be less concentrated, the blue tint will enter immediately, but dissappear by shaking the vessel. Then add some drops more from the burette, always moving the vessel in your left hand till the blue tint disappears, but slowly. At last a point will arrive when one drop of the solution of iodide of potassium will make the blue tint permanent, so that it does not disappear even on shaking the vessel. Now shut the cock and refer to the point on the scale, which is touched by the surface of the fluid in the burette. The number of degrees marked by it gives immediately the proportion present of silver salt contained in the tested solution. If, for instance, you find the fluid touch the point F 3-5ths, your silver solution contains F 3-5ths per cent. of pure nitrate of silver. The operation with burette and the cock requires some practice, but which is got with easiness in a short time.

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[*] This little part of nitrous acid, NO^3 is procured, by adding to the nitric acid about 1-1000th of sulphate of iron.

[*] Of course the pipette must be cleared of the solution used before, or the new would mix with the old one, and give wrong results of the percentage. In order to insure success, suck the fluid into the pipette and blow it out again, repeating this operation several times.

Working with a concentrated silver solution you will do better to add during the proof, with iodide of potassium, some drops of the solution of starch, especially when the blue tint, before its disappearance, becomes dirty and pale.

The testing of brown coloured solution, which often happens with old positive baths, is accomplished equally easily, though the tints of the fluid, of course, are less clear and distinct.

If the tint of the fluid does not appear at all, the nitric acid or the starch do not work well. The latter then must be prepared afresh, the first is easily made efficient by adding some grains of sulphate of iron.

When not used, the burette and the bottle containing the solution of iodide of potassium are to kept well closed with a cork.

The starch solution is to be prepared in the following way: grind a ¼ part of starch with but little distilled water to a soft paste, then pour upon that about 25 parts of *boiling water*, always stirring up the paste. When the mixture has cleared by settling down, decant the fluid, or filter it through a layer of cotton wool, and add to 100 parts of it 20 parts of *pure* (chlorine, free) nitrate of potassium, to make the fluid more lasting, say two months. Look that the fluid be as clear as possible, so it will work the better.

But it must be added, that in presence of salts of copper, quicksilver and hypo, which will not happen often in practice (except in the latter case), the proof here described is not practicable.

I have read this paper to the Photographic Society of Berlin, the 20th December, 1864, and many photographers employ the method already with great satisfaction.

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ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

Etching by Galvanism was suggested by Mr Alfred Smee; it was similar to the ordinary process of etching, but instead of being bitten in by a direct acid action, Mr. Smee suggested that the etched plate should form the positive pole of a battery, and being dipped in a galvanic trough of sulphate of copper through which a current was passed, particles of copper would be given off from the etched lines of the engraving; the plate was to be removed from the bath from time to time, for the purpose of stopping out, and graduating the tints required, as in the usual etching process. Mr. Smee considered that the advantages of his galvanic process are the absence of nitrous fumes, greater uniformity of action than when acid is used, greater rapidity of biting, and at the same time any required depth of line can be obtained, and the lines themselves will be sharper and cleaner, owing to the etching ground not being torn up by air bubbles. I am not aware that the suggestion of Mr. Smee has ever been commercially applied, but he has continued his investigations. In 1851 he presented a report to the governor of the Bank of England, in which he stated that he considered the time had arrived when surface printing from electrotype blocks could be advantageously employed in the production of Bank of England notes. His proposition has since been carried out, and at the present time Bank of England notes and cheques are so printed. I would not have it inferred from this fact that what is economic and available for Bank of England purposes, is either expeditious or commercially available. Those who desire full details of the process employed by Mr. Smee in the production of surface blocks, I would refer to a paper read by him before the Society of Arts, on the 20th December, 1854, and which is published in full in Vol. III., page 81, of the the *Society of Arts Journal*. Etching by galvanism forms the connecting link between electro-engraving and the daguerreotype art.

Etched Daguerreotypes.—The discoveries of Mons. Daguerre were first formally communicated to the world by M. Arrago, who, on the 7th January, 1849, read an account of them before the Academy of Sciences in Paris. The invention consisted in the discovery of a process whereby the image obtained in the camera obscura could be permanently fixed on a metal plate. The process soon became known as the daguerreotype art, and its results as photogenic drawings. These were produced upon plates of copper coated with silver. The silvered surface was then washed with a solution of nitric acid, after which it was placed in a closed box, where it was subjected to the action of the fumes of iodine. An ioduret of silver was thus formed. Thus sensitised, the plate was next exposed to the action of the rays of light within a camera, when the image to be copied became impressed upon it, and was then permanently fixed by immersing it in a bath of hyposulphate of soda. Having been well washed with clean water, it was capable of being exposed to ordinary day-light without injury. Mr. W. R. Grove, in 1841, described his method before the Electrical Society, and stated that he used dilute hydrochloric acid in the galvanic trough, having first coated the daguerreotype plate with gold, which amalgamated with the mercury on the surface plate, and that this acid, by acting unequally upon the different parts of the daguerreotype plate, according to the extent to which the light and the mercury had before acted, bit it away in the manner of an etching, so as to produce deep lines in the shadow parts and fainter ones in the light tints. The proposition of Mr. Grove was not lost sight of by Mr. Claudet, Mr. Fox Talbot, and others, who early made attempts to engrave and print from the daguerreotype plates, but the delicacy of the surface of the plate, and the nature of the subjects selected, prevented the process from being practically adopted. Subsequent discoveries, and the art of photography, to which I shall presently refer, have, nevertheless, produced some of the most perfect examples of engraving by the combined action of light and electricity.

I must now retrace my steps and recall attention to the discovery of Mr. Murray, who, having succeeded in giving a conducting surface to non-metallic bodies by the use of plumbago, placed within the reach of the scientific man a new and as yet unheard of process of engraving, which is known as Nature-Printing. The first examples of this art were also due to the discovery and use of a substance made known to the world through the Society of Arts in 1843—I mean gutta-percha.

Nature-Printing, as it is called, was first introduced to the notice of the public through the Society of Arts, which, in its notes of proceedings for the year 1849, printed a communication from Dr. Ferguson Branson, of Sheffield, in which he stated he had ascertained that by enbedding a fern leaf, or any other flat body in softened gutta percha, and then allowing the gutta-percha to cool, upon removing the leaf a perfect mould was obtained, from which mould an engraved copper-plate fit for the printer could be secured by means of the electrotype process. A plate so obtained, with prints taken from it, accompanied the communication. Nature-Printing, however, did not long remain in this normal condition, for in the Exhibition of 1851, in the Austrian department, were exhibited specimens of plants, flowers, &c., printed in colours from copper-plates. It had been ascertained that if a rolling pressure was employed to embed the object to be copied, that then soft sheet lead could be used, and that process was subsequently introduced in this country, and employed by Mr. Henry Bradbury in the production of his work on Ferns and Mosses. Nature-Printing did not stop here, for in a communication read before the Society of Arts in 1854, by Mr. Aitkin, of Birmingham, we find that, by means of a rolling pressure, objects of various kinds, and of the most delicate description, such as thread-lace, the down of a feather, &c., could be made to engrave itself in Britannia metal, copper, brass, German silver, or tin plate, and, to use Mr. Aitkin's words, "more wonderful still, on what we are led to believe is the most dense and hardest metal in ordinary use, viz., steel." Mr. Aitkin pointed out some novel and interesting applications of nature-printing then in use at Mr. R. F. Sturge's works, at Birmingham, in the ornamentation of metal surfaces, by means of patterns cut out of sheets of paper, and placed between two plates of soft metal, and passed through the rolling press. The effect produced was that of a burnished figure in relief upon a frosted ground; this resulted from the contact of the two metal surfaces, which burnished each other; but the paper, being embedded in the two metals, gave to the surface of the metal round the pattern a grain which may be described as a print from the pulp of which the paper was made. I must not, however, here enter upon the industrial and manufacturing uses to which electrotype deposits and nature-prints have been applied, but will direct attention to another process, in which the principle of nature-printing has been proposed to be applied as a substitute for engraving—I mean the process submitted to the Society by Mr. George Wallis, and called by him Auto-typography. In this process Mr. Wallis substitutes for, or in combination with, a natural object, a drawing made upon a surface of gelatine. This he selects as it has no grain, and is to a great extent non-absorbent. His drawing is made with an ink or fluid, which, when dry, either crystallises, or forms a naturally-granulated body in relief, upon the surface of the gelatine. The drawing, having been carefully prepared, is then passed through a press, in contact with a metal plate, into the surface of which the drawing becomes embedded, and the result is a transcript in copper of the artist's own drawing, from which prints may be worked in the usual manner. Notwithstanding the suggestions above related, I regret to say we are still without that great desideratum, a surface block, or a ready means of obtaining one, at a commercially economic rate, by a process which will give to the artist a true translation of his sketch or finished drawing; to the commercial world an economic means of extending a knowledge of art, and of cheapening the cost as well as extending and facilitating the means of book illustrations; and to the public the advantage of a ready means of cultivating economically a knowledge and a love for all that is elevating and beautiful, both in nature and art, as well as a means of educating the youth of our country by means of cheaper, more numerous, and better examples than are at present generally attainable. But before I close this communication, which I propose to do by referring to other processes which I think deserve more attention than they have hitherto received, and which I believe to be capable of helping to solve the problem of how to obtain a surface block, I must, in justice, refer to the photo-galvanographic process of Mr. Paul Pretsch, the photo-lithographic process of Colonel James and others, and the process for enlarging and reducing drawings and engravings patented by Mr. H. G. Collins. I have already spoken of the efforts which Mr. Grove made to engrave the image obtained upon the daguerreotype-plate, and it is due to Mr. Archer, who was the first to propose the use of collodion as a medium upon which light might be made to impress an image, that I should state that it is to that gentleman's discovery that the world owes its present advanced position in the art of photography.

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* Continued from page 80.

(To be continued.)

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Proceedings of Societies.

North London Photographic Association.

The usual monthly meeting was held on the evening of Wednesday, the fifteenth instant, Mr. W. Hislop, F.R.A.S., in the chair.

The minutes of a former meeting were read and confirmed, after which the following gentlemen were elected members of the Society:—H. W. Diamond, M.D., F.S.A., &c., H. P. Robinson, H. Cooper, jun., W. Ackland, and J. Werge.

The Chairman then said, that as the annual meeting of the Society would take place next month, the committee suggested that the number of vice-presidents be increased to four instead of two; also taking into consideration the inconvenience of having the meetings held on the third Wednesday in the month, they suggested that it be changed to the first Wednesday in each month; and further, that considering the expense incurred by the Society in supplying each member with a copy of a weekly journal, it would be discontinued, and a monthly one—the journal of the Photographic Society, which had been secured on favourable terms—would be supplied in its stead. The probable saving thus effected would enable a better and higher class photograph to be presented to each member.

A letter from J. Glaisher, Esq., F R.S., was read, in which he expressed his satisfaction at the North London Society being, to a certain extent, connected with the Photographic Society.

Mr. J. How exhibited one of Harrison's lenses, which was fitted with an expanding stop moved by an arrangement on the brass-work of the lens.

Mr. Collis (Ottewill, Collis, and Co.), exhibited two backs for cameo portraits, adapted for taking two sets of cameo portraits or two cartes de visite at the same time, the movement was very similar to that exhibited some time ago for a single lens.

Mr. F. Bedford exhibited some 10 by 8 views of Welsh scenery, also of Warwick Castle, &c., which he had produced for the City of London and National Art Union. One view of Warwick Castle from the garden near the bridge, was most beautiful. It is to be regretted that such subjects as these should be in the hands of a society for distribution to prize-holders instead of being accessible to the general public. We must not omit to mention one which was not among the set last mentioned, viz., that of the choir screen of Hereford. This wonderful piece of metal work, by Mr. Skidmore, after the designs of G. G. Scott, Esq., R.A., is doubtless familiar to most of our readers, from its having occupied a conspicuous position in the eastern transept of the International Exhibition. Mr. Bedford seems to have overcome the difficulty of getting a photograph of the screen *in situ*, and to have produced one which recalls the loveliness of the original in a most perfect manner; even the background of the Vescica, from which the figure of our Lord projects, is clearly visible, and with the view of the altar seen through the entrance gates, makes one of the finest views we have seen. He also exhibited a very charming series by Dallmeyer's No. 1 triple.

The Chairman, seeing Mr. H. Cooper, jun., in the room, asked him if he could favour the meeting with a few observations on the uranium printing processes.

Mr. Cooper said he was unable to do so at present. He intended to have brought some prints, but unfortunately had left them behind. He, however, promised a paper on some future evening.

A vote of thanks was passed to Mr. Bedford for exhibiting the views which were universally admired, and to Mr. How for exhibiting the Harrison's lens with the expanding stop. Respecting the latter, the Chairman remarked that he thought the stops very convenient, they occupied a small space, and were not like those ordinarily in use, liable to drop into the long grass or into the chinks of a rock, often compelling the photographer to cut a piece of card to take their place. He suggested an index, which Mr. How said would be added.

The nomination of officers then took place.

The present officers were proposed for re-election.

The following nominations also took place:—

For vice-presidents: Mr. George Shadbolt; Mr. George Dawson, M.A.; Mr. J. J. Cole, F.S.A.; Mr. Hislop, F.R.A.S.; Mr. W. Warwick King.

New members of Council: Mr. H. P. Robinson; Mr. J. How; Mr. W. Ackland; Mr. H. Cooper, jun.

Mr. J. How and Mr. Collis were unanimously elected auditors.

The meeting then adjourned till the 22nd day of March.

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Correspondence.

COPYRIGHT IN ENGRAVINGS *versus* "PIRACY."

Mr. Editor,—You have no doubt been gratified at the affection for you displayed by "J. S. W." in his letter last week. "Detector" and his brethren are unquestionably a bad lot; their outcry "is merely meant to conceal very dishonest proceedings on the part of very unscrupulous people," with a "very loose idea of *meum* and *tuum*,"—it is "a mere cloak to cover that which they well know is illegal," &c., &c. But, for *you* to have in any way taken their part! Really, better things were expected of you. Already you are somewhat contaminated, and give "J. S. W." anxiety for the consequences. Do purge yourself by an active course of remedial measures. Remove your ignorance; sit at the feet of the editor of the *Art Student*; get once more into good society; then you may be saved, and "J. S. W." will rejoice over you.

What change has come over your correspondent? In his first reply to me he was calm, dignified, interesting; and I had pleasure in setting right the few points on which he erred. But now he has quite lost his temper, and, in the blindness of indiscriminate attack, lays about him at random. Or, finding his own case a bad one, he adopts the legal maxim to "abuse the opposite attorney." Well, so long as his attacks are like the present, there will be no harm done: they relieve him, and do not hurt us.

Instance a blow intended for you, Mr. Editor, but by which "J. S. W." only hurts himself. Challenging your assertion that "photography will give you cheap art, and ought to be employed," he yet brings against it only the following:—"If you would but go to the artists, engravers, printsellers, or Christie and Manson's, they would undeceive you." They aim at "wealthy patrons, not the public." "With the knowledge you possess, how can you reconcile these parties" with the public who demand cheap art?

Is "J. S. W." able to see, that here he has been "hoist with his own petard,"—that the witnesses he appeals to have proved the case against him? If artists, engravers, and printsellers work for wealthy patrons instead of the public, what is left but photography to supply a cheap demand? Just what you said, Mr. Editor, and what "J. S. W." disputed; but only disputed to condemn himself with his own words. "J. S. W's." reasons have run away with him, even to the camp of "Detector!"

But, it appears (according to "J. S. W.") that the art of engraving need not fear photography. Its "wretched exhibitions, which you may see as you walk along the streets and suburbs of London, are enough to make anyone with taste shudder"! "Men conversant with the works of artists, illustrious by their genius, view such productions with disfavour. And, looking at the classes who have adopted photography, could you expect art from those who *had had* no such education, and, in many instances, were totally ignorant of any of its principles?"—Those who "had had" no art-education, says this lofty critic, who considers "Detector" "a very unreliable censor," and brings up again the editor of the *Art Student*, to say that "the art may 'lay' under a cloud for a time," but will see a reaction. If photographs be so wretched, and engravings so brilliant, how can the former lay the latter under a cloud?

Only one other assertion by "J. S. W." requires notice. He claims, that the Printsellers' Association are only severe against those "spinsters and widows" who sell photographs and refuse to give up the names of their suppliers or producers. This is not true; as "J. S. W." may find for himself, by inquiry at any of the London bazaars. Said a printseller to a wholesale photographic dealer, only recently, "We don't want to go at you, we know you will fight; but we mean to prevent your customers from dealing with you. We made £800, last year, out of photographers, and the game is too good to give up." The producer's name is, almost universally, freely given up, in hope of escape; producers give their customers full liberty of disclosure; but I speak solemn truth, provable by documentary evidence, in saying, that alleged damages are extorted, in face of that, from timid or ignorant dealers, extorted, too, for the sale of pictures whose copyrights have been parted with by their publishers for valuable considerations, and on which they dare not base an action at law, if put to that proof of their claims.

So common has this practice become, that the leading producers of photographs from engravings have formed a PHOTOGRAPHIC PROTECTION SOCIETY, to put an end to it, and protect those customers whose ignorance, timidity, or poverty, renders them liable to attack from the chivalrous and artistic class "J. S. W." so lauds and adores.

The "Notices to Correspondents" of this paper corroborate my assertion. Any dealer in non-copyright photographs, who may be threatened with prosecution, is requested to address "Detector" at the office of this journal, the details duly appearing in your advertising columns.

I must ask of your courtesy, Mr. Editor, a few more lines in reply to * *, who asks if the accidental finder of a purse with money deems himself justified in keeping one and spending the other? If not, it is argued, a photographer has no moral right to use an unlettered engraving.

There is a wide difference between the two cases; in fact, they are not parallel. The loser of the purse got nothing in exchange for it—did not throw it away, did (knowingly) no act to imperil it. But the print publisher *made his market by throwing down* his engraving, deprived of everything which could give clue to its ownership—did it knowingly, voluntarily, and for gain; then, seeing it *picked up* (if you will), accuses the possessor of immorality.

But engravings are not "picked up" as a purse in the street. They are bought; and, when bought, the vendor has in the purchase money all his just claim. The higher claim of copyright he thought fit to waive; it might have been his, the means for its acquirement and preservation were open to him. No one, unless he wills it, can "pick up" his engraving, or take it away through the absence of defensive law.

Thus, even on the high ground of ethics alone, the photographer of an unlettered engraving is justified. On the lower one of commercial law (which all engaged in commerce must admit is mutually binding), he is equally justified. It is no argument against his right, that some persons invade even properly protected copyright. There are black sheep in every flock; but because some are black, are none white? As well say, that because some pictures have no copyright, therefore copyright does not exist. Let "* *" study the matter in a fairer spirit, and he will think differently.

Your obedient Servant, DETECTOR.

COPYRIGHT IN ENGRAVINGS.

SIR,—As your correspondent, "J. S. W.," seems to be well acquainted with the subject, and has, in my opinion, written many good things about this difficult question, I think that he ought to be set right in respect of a point named in his last letter to you, February 17th:—"In regard to finished proofs claimed by engravers as a right, &c., &c." This is a mattter in which no doubt can exist, and I can show your correspondent some of *my written agreements* with both London and Paris publishers, specifying that, besides the price mentioned to be paid to me for the engraving of the plate, I am entitled to a definite number of proofs, eight to a dozen was and is still the number actually allowed. These proofs my brother artists and myself, have as a matter of right and of custom always had struck off the plate *before* the delivery of it to the publisher's hand. Believe me, my dear sir, yours truly, F. JOUBERT.

PANORAMIC PROJECTION *versus* PLANE PROJECTION.

SIR,—Mr. Le Neve Foster's correction of your report of the discussion on the pantascopic camera, at the January meeting of the London Photographic Society, is no doubt correct; but it does not accord with my recollection of what then passed, nor with that of several of my friends. Mr. Foster was then understood to say that—"He should be sorry that it should go forth, &c.—that these views were true." The statement was absolute, and in reply to it, I asked, what was truth?—by what standard were these pictures to be tested?—was it plane perspective? But I had already said that they were panoramic. Mr. Foster's protest now contains the words "*on the plane surface*." Surely, sir, the assertion thus qualified is a mere truism, and contradicts nothing which has been asserted of these views by me or by any of my friends. In general terms it merely means that pictures projected upon one surface must not be viewed upon another; or less generally, that panoramic views are not views in plane perspective, and cannot be treated as such. To prevent further misconception, I will make, with your permission, the following assertions, upon which I should be glad to have Mr. Foster's observations, if any difference of opinion exists between us, which I greatly doubt:—

1. The means of obtaining views of large angle free from distortion have long been an acknowledged want in the art of photography, and that deficiency has been a constant source of reproach on the part of landscape painters.
2. By the pantascopic camera such views may be easily obtained even up to 360°.
3. Views of from 180° to 360° cannot be projected in plane perspective. It is an impossibility, practically speaking.
4. In views of large angle, say from 100° to 180°, considerable distortion is induced by the use of plane perspec-

tive from the great obliquity at which the visual rays from the remote objects intersect the plane of the picture. Even in views of less than 100°, artifices, not consistent with absolute truth, are often employed to correct this defect, and prevent the really true perspective offending the eye.

5. Artists like Burford and Selous, who have painted views of large angle, have adopted panoramic perspective, the surface of the picture being that of a vertical cylinder. Views on such a surface, when duly projected, are mathematically true and correct; but like all perspective views they must be viewed on the surface upon which they were projected and from the same station point.

6. The pantascopic views are in true panoramic projection, for the central pencils of the lens only being employed, they are free from optical distortion; and the motions of the flat plate are such that the intercepting surface becomes that of a cylinder, or more strictly it is the surface of a polygonal prism, having an infinite number of sides.

7. Photographic views of large angle in panoramic perspective have many advantages over those in plane perspective. Among others, two only shall be mentioned.

a. They are superior as materials for artists, because from such a view, curved to the proper cylindrical form, and particularly if placed before a large lens, as in the aleoscope of Ponti, an artist may draw as from nature, choosing any point of sight, for these views have as many true points of sight as there are imaginable mathematical points in the horizontal line. A plane perspective view has only one point of sight, and is only true for that point.

b. They are superior as *scientific* records, for these views not only fix or register what the eye sees when it turns round towards the whole horizon, but the images of the objects thus depicted may be used like the objects themselves, for actual angular measurement. Two such views taken from the two extremities of a measured base line furnish the means of constructing a plan, that is, of defining the actual position, *in situ*, of all objects visible from the two stations.

It is needless to expatiate on the numerous advantages of such views.

1. To the traveller exploring an unknown region—for with a few pantascopic views of the whole cycle of the horizon, taken from elevated positions, with as many compass bearings of leading objects, a comparatively perfect map of the country could be formed at leisure.

2. To the Alpine traveller having attained at great toil some mountain peak.

3. To the engineer or architect, visiting officially, or for the purpose of study, some elaborate construction.

4. To the military commander or engineer making a reconnaissance of the position of the enemy, or of his entrenchments or fortifications.

I will say nothing as to the artistic character of the pantascopic views, except that several eminent artists whose names I can give Mr. Foster, have expressed opinions directly the reverse of his; and that for these views, which were unworthy of mention (as such) in the catalogue of the London Photographic Society, and against the value of which eminent members of its Council consider it necessary to enter a formal protest, the Photographic Society of Scotland, with Sir David Brewster, the greatest living optical authority at its head, has granted a silver medal.—I am, sir, yours, &c., J. R. Johnson.

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Photographic Notes and Queries.

Mr. Fox's Printing Process.

Sir,—In the Photographic Year-Book there is a partial description of a new printing process by Mr. Thomas Fox. I say partial, inasmuch as there are no formulæ given for the quantities of bichromate of potash and sulphate of copper to be used per oz. of water, and the logwood developer is merely mentioned as "a strong decoction." I have tried two or three experiments with the process, and have failed hitherto to develope the image properly, although using different strengths of logwood each time.

It is possible, therefore, that a particular strength of the sensitizing agent is requisite, notwithstanding that I have strictly observed the relative proportions of bichromate of potash and sulphate of copper *to one another*, as laid down by the inventor. May I ask you, Sir, whether any trial of this process has been made to your knowledge since it was first described in the Photographic News? Perhaps some of your readers of greater experience than myself may have made some experiments in this method; or Mr. Fox, perchance, may not object to enlighten amateurs on the subject.

The ingredients are so cheap, and the whole process so speedy, that it would be really a boon to those, like myself, whose spare time is but limited, to obtain a further insight into the details of the process.

I may add that, in my own experiments, I have had no difficulty in obtaining a defined, though necessarily faint, image on the sensitized paper from the prints I have used for the purpose. The failure has hitherto appeared to rest with the developer, and the stronger the logwood decoction employed, the worse has been the result.—Your obedient servant, Hy. Andrews.

Sydenham, 16*th February*, 1865.

[Mr. Fox's process is patented, but the specification is not yet published. The only details as yet made public are given in his paper read before the Photographic Society of Scotland, and which appears on p. 556 of our last volume. No detailed proportions are there given, and the patentee speaks of gaining different kinds of results, according to taste, by varying the strength of the solutions.—Ed.]

Waterproof Colours for Photographers.

Sir,—In your number of Photographic News for February 10th 1865, there appeared a letter from Mr. D. Fruwirth, repeating the use of aniline colours in tinting photographs, applicable, I understand, to prints on albumenized paper. Individually I beg to sincerely thank Mr. F. for drawing my attention to the subject, and should feel much obliged by your making me acquainted with his address, in the column devoted to answers to correspondents in Photographic News, or by handing over my present letter to him.

I am induced thus to trouble you, in the hope of having the following queries kindly answered either by yourself or Mr. Fruwirth.

Referring to Mr. F's letter in 336th number of Photographic News, I learn that his specimen picture, No. 1, was made waterproof by an application of a solution of wax in ether. May I enquire what advantage or good is obtained by its being thus made waterproof?

Specimen, No. 2, is described as having been glazed after painting. May I also ask whether this picture was painted with aniline colours, and with what application the glazing was effected? Am I right in inferring that the latter was done also by means of the wax and ether solution?

Specimen picture, No. 8, tinted with aniline colours, being the method with which I am most interested; may I indulge the hope of being favoured with a carte size specimen on paying for it?

The method of making the aniline colours not being generally known, may I enquire what the basis of their composition is, or whether there is perfect safety in using them with reference to the permanency of the photograph?

Begging to apologize for the trouble to which I am about to put either yourself or Mr. Fruwirth in answering the above lengthy series of questions, *i.e.*, should either of you kindly feel disposed so far to oblige me, and anxiously looking forward for the appearance of the further particulars, which Mr. Fruwirth has so generously offered in his letter, for the benefit of the readers of your most useful and interesting periodical, not forgetting your own promised article on Mr. Mansion's method of using his dry colours, which, I heartily hope, will not be long delayed.—Believe me, sir yours very truly,

Henry H. Hele.

Teignmouth, February 18*th*, 1865.

P. S.—In Mr. Fruwirth's letter *Jacobsen's* aniline colours are recommended, which I cannot get here. I should be glad to be informed whether *Judson's* will do as well, and whether any difference exists in the chemical composition of the colours of the two makers.

I did not previously know that there was any other manufacturer of aniline dyes besides Judson, which led me to infer that they were patented,—am I right in so thinking or not?

[Our correspondent's queries are so much to the purpose, expressing doubtless the questions upon which many photographers desire information, that we insert them here with a view to obtaining the information, which will be better understood by appearing after these questions. We may mention that Dr. Jacobsen is an eminent German chemist photographer, and has devoted some attention to the application of aniline colours to photography, and, we believe, prepared some expressly for the purpose. Our own article on colouring, with M. Mansion's materials will appear very shortly. We never like to write on any subject without some practical experience, and merely wait for the completion of some of our operations in this direction. Mr. Fruwirth's address is Palace Road, Upper Norwood.—Ed.]

Sir,— will you permit me to state in reference to my process, that I do *not* use the aniline colours spoken of by your correspondent of last week, but the water colours in common use. Neither do I use ether, or wax, or glazing, and that by my process the colours may be painted opaque or transparent without any loss of detail. I beg to remain, sir, yours respectfully,

L. Bing.

South St., Bishop's Stortford, Feb. 16th, 1865.

Keeping Tannin Plates.

Sir,—In reference to the keeping of tannin plates it may be interesting to your readers to know my experience on this point.

The enclosed are samples of the results obtained after an interval of nearly sixteen weeks between the exposure and developing. I used Mawson's collodion, 40-grain neutral bath, washing as usual, 15 grains tannin, *no* alcohol. The plates were exposed October 11th, 1864, and developed February 4th, this year, with 5 grains pyro, 1 minim acetic, and 1 ether to the ounce of water, to which was added the acid silver as usual.

The pinholes, spots, &c., in the enclosed prints are caused, I think, solely by imperfect manipulation on *my* part, and are not, I think, the result of long keeping.

I think that if your correspondent "E. E. D." would try *alcohol and water* (about equal parts), as recommended by Major Russell, instead of water alone, to wet his plates before developing, he would avoid the marks he complains of, although I cannot explain the reason why. I can only say that in pouring on this mixture, I make several distinct pauses, but I have found no marks left on the films.

I expose with No. 1 triplet, No. 4 stop, about ten to twelve minutes on a dull day.—I remain, your obedient servant,

N. K. Chevrill.

Belmont Lodge, Lee, S.E.

[The samples enclosed are clean, brilliant, and, in many respects, very perfect indeed.—Ed.]

Guarantee Fund For Photographic Exhibitions.

Sir,—Your remarks upon the Photographic Exhibitions of the Society appear to me well timed, and the suggestions that a guarantee fund be formed would probably meet the case in a pecuniary point of view.

Now sir, is it not possible to *popularise* photographic exhibitions? I believe it is, and as a feature of interest and attraction in connection with the usual ordinary exhibitions, would suggest that there be a separate prize exhibition of photographs. Competitors to pay an entrance fee of not less than £2 2s. 0d., on the same principle that other prize exhibitions are managed.

If fairly and well conducted, this would arouse the emulation of photographers throughout the world, would excite the interest of the general public, and consequently place the exhibition fund in a flourishing state.

As prize photographic exhibitions have been usually managed, the prizes, as a rule, have been awarded to some few men of note, worthy no doubt; but I am much mistaken if others are not to be found quite capable of holding their own with our reputed best artists.

At all events, an entrance fee of from two to five guineas, would ensure exhibitors of first-rate ability and position; on the other hand, in the fulness of self esteem, if persons of inferior ability did enter the lists, no harm would ensue to any but themselves, they justly suffering both in pocket and reputation for their ignorance and temerity. That there are many objections likely to be raised to this proposition, and some difficulties to be got over I am well aware, but am persuaded the scheme would succeed, if, as I before remarked, well and impartially conducted.

Other prize exhibitions succeed, and why not this?

Some effort is required to elevate the photographic profession, to rescue the art from pretenders, and to place it on a level with its kindred sisters—poetry and painting. Your obedient servant,

A. N.

31, Trevor Square, Knightsbridge.

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Talk in the Studio.

The "Standard" on Photography.—A leader in the *Evening Standard*, referring to the Chief Baron's speech at the annual meeting of the Photographic Society, has some excellent remarks. It says:—"Photography is making rapid progress, and is laying almost every department of knowledge under some degree of obligation to this new science. As a general limner of the people's portaits, photography is a sort of social institution, encouraging domestic affection almost to the same degree as the penny post. But in the higher walks of science and of art photography is gathering abundant laurels." After referring to the astronomical photographs of Mr. W. De La Rue, it adds:—"Photography not only soars to the ecliptic, it condescends to the minute and the obscure. About four years ago Mr. Thompson, of Weymouth, photographed the bottom of the sea! A continental philosopher has recently departed for Egypt, in order to photograph the dark interior of the Pyramids by the aid of the magnesium light—a flame richer in actinism than the ordinary daylight of England. It reckons among its students and experts, a long and illustrious roll of names. Allied with chemistry and the microscope, it seems destined to give us what we might almost style a new sense—certainly a second sight. It has itself assisted to explain the functions of vision by instigating the invention of the stereoscope, an instrument which plays with our eyes after the fashion in which nature uses them. Thus photography not only develops itself, but helps to develop other branches of human knowledge. It is the handmaid of almost every art, and promises to become the pioneer of all the physical sciences. Originally a source of pleasure, it is daily proving its real utility."

Photographing the Interior of a Mine.—We learn that a few days ago, an attempt was made to photograph the interior of the Blue John Mine, near Castleton, Derbyshire, by means of the magnesium light. It was not wholly successful, because the higher temperature of the mine over that of the outside air, caused a condensation of moisture upon a portion of the apparatus which escaped notice. Mr. Brothers has favoured us with a print of the negative obtained, which is very interesting, and sufficiently good to show the important possibilities of the method employed.

Early Carte de Visite.—Mr. Skaife has recently favoured us with a specimen of a visiting card portrait, of a date many years earlier than the actual advent of the present photographic fashion. It is a card containing a wood engraving of a full length figure, slightly grotesque in design, of Dr. Purland, who left it, as a visiting card, at Mr. Skaife's residence, Vanburgh House, in 1851.

The Magnesium Light for Pistolgram Portraits.—Mr. Skaife has been using the magnesium light succesfully for portraits with his minature pistol camera. Some examples with which he favours us, were, he states, produced with an exposure of from 4 to 6 seconds. "But" he adds, "recent experiments lead me to believe that likenesses under certain conditions may be obtained by magnesium with a much less exposure. A few days ago I was commissioned to take the pistolgram of a child three years of age at own residence. On arrival, I found the child in bed very ill with the measles. Knowing that so young a child even in good health would not stand the startling brightness of a magnesium flash, without flinching, if the experiment was made whilst it was awake, I deferred making the attempt until I saw it was asleep. The instant, however, that the full glare, as concentrated by one of Grant's reflectors, fell upon the closed eyelids of the child, its head gave a violent start upwards, about nine inches from the pillow, as though it had received a galvanic shock, then fell backwards, but in a position of retreat from the direction of light, with its little hand covering its eyes. This violent effect, though too alarming, considering the little patient's precarious state, to warrant the experiment being repeated in the same way; yet on developing the result, I was so surprised to find it a fully exposed and sharply defined positive, that I could not resist the temptation to try a second plate; with however the child's eyes averted from the direction of the light. But no sooner had the full force of the light fallen on the ear, cheek, and back of the head, than the child awakened with a start as before, though in a less degree. The result on development being as in the first case, a well defined positive, as regards the head, ear and cheek, with its measly rash. The exposure in either case not being more than one second and a half, less by one half than has been obtained by me out of some two hundred previous magnesium light experiments. Whether this unusual rapidity is owing to the measly atmosphere emanating from the patient, or the actinic state of the skin itself, in its second day's development of the rash, or a combination of both, perhaps some of your scientific readers, learned in ozone, could determine.—Believe me, dear sir, yours truly,

Thos. Skaife.

To Correspondents.

The Victoria Cross Gallery.—In anwer to the enquiry of "R. M. A." two correspondents kindly forward information. Mr. Fruwirth, of Norwood, states that the pictures constituting this gallery were photographed by Messrs. Negretti and Zambra, but that the negatives were destroyed, and that the "Battle of Inkermann" is the only print now to be had. Mr. Wass, of the Picture Gallery Department at the Crystal Palace, states that a new edition of the whole series will probably be issued, carte size. Mr. Cox Walker, of Liverpool, states that Mr. Harry Wood is now the owner of the Victoria Cross Gallery, and of the photographs of the same, but that he does not think that any are on public sale.

G. B.—To retain the rich purple tint after the prints leave the hypo you must tone deeper and probably print a little deeper.

No. 90.—A portrait lens with a stop in front will answer best. 2. Citric acid is soluble in less than its own weight of water at 60°; one minim of a saturated solution would, therefore, contain more than a grain, and would be sufficient in cold weather to add to one grain of pyrogallic acid in solution for intensifying; double the quantity or more may be used in hot weather.

Cymro has a dark box or laboratory on wheels for photography in the field. He asks, "Suppose I had a pony, or the loan of one, and ride upon it to take views, should I have to pay duty for it?" We should think not. Can any of our readers answer with certainty?

J. Tomlins.—We are obliged by the description of your ingenious method of obtaining the image on the different positions of the plate for diamond cameos. We fear, however, that except in the hands of a person of considerable mechanical skill, the arrangements would be very difficult to make so as to produce satisfactorily.

Intensifier.—Many of Mr. Blanchard's pictures are intensified at home as he describes; but whether his latest series were so treated or not we cannot say, but will enquire. The use of glycerine to keep the plate moist before fixing sometimes causes fog, but we can see no objection to its use after fixing with a view to further intensifying before drying.

Carmine.—Either bad collodion or the bath being out of order may cause difficulty in obtaining sufficient intensity. Possibly your bath is weak, old, and acid; possibly your collodion lacks body, or is decomposed. The application of a solution of iodine to the film before intensifying in such cases is often a great aid. The pyrogallic intensifier rapidly becoming turbid and decomposed, often arises from adding too much silver or too little acid.

A Subscriber.—The best material for colouring large subject photographs is much a matter of taste, and depends upon the kind of effect required. We have seen good effects in water, in oil, and in crayon. Personally, we think oil is best for many reasons. It is most effective, it preserves the picture best, and in the very little leisure which our occupations permit us to devote to painting, we prefer oil. 2. Your second question as to "the surest method of producing good *cartes de visite*," is somewhat difficult to answer in a few sentences. We can only say get good materials and use taste and judgment in employing them. If you have any specific difficulty, or fail in any especial part of your work, we shall be able to aid you if you state it in detail, better than we can answer such a general question.

R. J. S.—We cannot recommend any specific maker in these columns without doing an injustice to others. You may get a good article of several makers whose names you will find in our advertising columns.

A. Gray.—The most colourless varnish is that made of white lac dissolved in alcohol; but all varnishes of anything like body have a slight yellow tint, which is in no way injurious. Amateur varnish making is generally a failure. The simplest and easiest to make consists of forty grains of fine gum dammar in an ounce of benzole. This is nearly colourless; but is not so hard as the lac varnish. 2. Much depends on the surface you desire, as to the kind of cotton you should use in making collodion for printing purposes. If you desire a high surface, use a cotton made at low temperature; if a moderate surface, a cotton made at a higher temperature and somewhat powdery will be better. That described in our Year-Book, p. 23, will give good results.

C. B. P.—From the print you enclose, we should judge the negative to be quite intense enough. In intensifying with tincture of iodine, care must be used not to proceed too far, as that will reduce intensity instead of increasing it. 2. You cannot do better than try the process of Mr. Hughes. Old and insentitive collodion may be used for cleaning plates.

L. A. D.—The toning bath used by M. Ommeganck is one of the lime baths, the formulæ for which you will find in our Year-Book. 2. Common salt may be used instead of hydrochloric acid to precipitate silver as a chloride, but many persons prefer the acid, as it is not liable to redissolve the chloride of silver as excess of common salt is.

A. B.—Your half plate lens will be the best of those you name for enlarging. The length to which your enlarging camera must extend is a simple matter of calculation depending on the focus of the lens, and the amount of enlargement required. If your lens have an equivalent focus of 8 inches, and you wish to enlarge 8 diameters, your camera must extend 72 inches. You will find the principles for your guidance explained in detail on p. 88 of our Year-Book. Mr. Burgess uses a quarter-plate lens. Where a single life-size impression is required, the solar camera is best. 2. The use of a sulphide is the most efficient for recovering silver from hypo. Mr. Hart's new apparatus for the purpose is also very efficient. See also Ommeganck's method in our last. 3. The amount of relief obtained in stereoscopic pictures taken with an ordinary bi-lens camera is just the same as that seen by the human eyes; the relief obtained by a wider distance between the lenses, such as that produced by Latimer Clark's camera, is an exaggerated relief. 4. The picture is a little over-intensified, and somewhat stiff in pose, but in other respects good.

An Old Subscriber.—We do not know of a simpler or better method of working the tanin process than that described by Mr. Hughes, and we have seen the admirable pictures it yields. Any good bromo-iodized collodion will answer. The tanin should be mixed with cold water. It is better made fresh. 2. To clear gelatine add the white of egg before boiling. Gelatine solutions do not keep well.

Advance.—So far as we know, plates by the beer process of Mr. Penny require from four to six times longer exposure than wet plates. Of their keeping qualities we are uncertain. You will find an interesting communication from Mr. Penny on the subject at page 551 of our last volume. 2. Mr. Breese's instantaneous pictures are produced by the wet process, and his transparencies also printed on wet collodion.

Wm. Sanday.—It is probable that, having warmed your plate, the film became too dry in the place where the insensitive patch appears. For the rest, excessive over-exposure will explain the defects.

W. May.—The markings are due to the irregular draining of the silver solution, which has accumulated on the plate in greasy lines. Either the plate is not allowed to remain sufficiently long in the bath, or the bath is much charged with ether and alcohol.

E. M. Major.—For printing transparencies by superposition the tannin process gives good results. but camera printing with wet collodion is a quicker method. In the latter case the prints should be toned with bichloride of mercury and ammonia, or hydrosulphate of ammonia. You will find an excellent description of the method, by Mr. Blanchard, in our Year-Book for 1864.

C. G. M.—An india-rubber bag or bottle is very convenient for out-door work, but it should not be made of vulcanized india-rubber. Common sheet india-rubber, or mackintosh cloth, should be employed.

Alpha.—You must register every different position to protect the whole. Enter the address of your residence. You must have a written agreement with the governor who has employed you.

J. Burgess.—Received. The improvement in tone is very great. We shall defer our notice to mention it.

Thomas Brownrigg.—Many thanks for the charming photographs sent. We shall probably have more to say on them shortly.

A. A.—We have received the collodio-albumen plate distinctly showing the action of light on the film in its supposed insensitive condition. We can only conjecture that the collodion contained a bromide as well as an iodide, and it seems tolerably certain that the insensitive iodide becomes sensitive in the presence of a bromide, or, indeed, of any additional salt of silver. We shall be glad to see the specimens, &c., by our process.

Photo-Student.—Dissolve bromide of cadmium, at the rate of 8 grains to the ounce, in alcohol, and add of this from half a drachm to a drachm to an ounce of the collodion. 2. Try the plan recommended in our last, but take care to sun it until it is quite clear. 3. *Pure* gutta-percha answers well for silver baths; but there are so many made of impure samples that we recommend glass in preference for safety. 4. Your formula is good. Persevere in the direction in which you are now striving, and and you will succeed.

Charles Waldack.—The communications received. We shall write soon.

Walter Woodbury.—Thanks. We will write shortly.

Ceramic.—It is probable that 1060 is published, but not the others. Specifications are to be obtained by purchase at the Patent Library, Southampton Buildings.

Several articles and communications are compelled to stand over for lack of space.

Several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. Thomas Skaife, 32, Sussex Place, Regent's Park,
Photograph of a Bombshell, *in transitu.*

Mr. George Hodoson, 103, Devonshire Street, Sheffield,
Photograph of John Wm. Pye Smith, Esq., of Sheffield.

Mr. Thos. Wardill, Thornton, Pickering, Yorkshire,
Two Photographs of Rev. Charles Johnstone, of Hackness, near Scarboro'.

Messrs. W. and D. Downey, 9, Eldon Square, Newcastle-on-Tyne,
Photograph of Earl of Beverly, Fifth Duke of Northumberland.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 339.—*March* 3, 1865.

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COPYRIGHT IN ENGRAVINGS, AND PHOTOGRAPHIC INFRINGEMENTS.

The majority of our readers will doubtless readily agree with us that the question of copyright in engravings has occupied quite sufficient of our space. The subject is an important and an interesting one; and we have been desirous of allowing a full discussion of the question: with a few brief remarks of our own we must now dismiss the subject. We shall not enter into the details of the controversy, which has been conducted with much spirit and intelligence by "J. S. W." and "Detector," except in those instances in which the former a little forgets himself, and undertakes to lecture and advise, instead of adhering to his argument. Both sides of the question have been put with tolerable force and completeness, and we leave each reader to his own decision on the subject.

We need scarcely repeat here our strong condemnation of everything which partakes in any degree of piracy. Our constant advice to photographers has been, where they had any doubt as to the existence of a copyright in a picture, to regard it as the property of some one and leave it alone. We have always urged them to respect the rights of property wherever they had even an implied existence. We have been unceasing in our demands for protection to copyright in photographs, which we could scarcely hope to obtain if a similar protection were not accorded to engravings and pictures generally. It is, therefore, from no indifference to the rights of property that we are compelled to regard the animosity of the print publishers to our art as unfair and foolish, and many of their complaints of piracy as groundless and absurd.

The great error committed by "J. S. W.," and by another able correspondent signing "* *," arises from their misconception of the meaning of the word *property*. They confound an idea with a thing. They speak of property existing in the design of a picture in the same mode as it exists in a purse. The distinction will become apparent on a moment's reflection. The purse can be possessed, used, or enjoyed by one person only, any use of it by a second person deprives the owner of it in just such proportion as the other profits by it. A second person, or a hundred persons, may possess copies of a picture without taking anything from the property of the original owner. The property in the picture itself is a very different thing from the property in the idea or design of the picture. The first is actual property, of which the owner cannot be deprived without loss; to its undisturbed possession he has a moral right; the design of the picture may be copied without any loss to the owner whatever, and it is only under special circumstances that he can profit by retaining such design in his own possession and for his own exclusive use. To meet such circumstances, the State gives him a conditional and a limited control over such design; but the property thus conferred by statute must not be confounded with a moral right to it. A man may build a house after his own design, he may decorate it and furnish it after his own design, he may plan and lay out his garden with great care, so as to produce a charming landscape. The design of all this may cost him much labour, time, and money; but will "J. S. W." fancy for a moment that a moral right to the property in this design is acquired, and that any one else building and furnishing a similar house and garden is guilty of dishonesty? A clothier may produce an especial pattern of coat, hat, or boots; is it ever imagined that another clothier is dishonest because, seeing that the designs of these were good, he makes something like them? Why the progress and improvement of the civilized world depend on the rapid recognition and general reproduction of good ideas. This distinction between material and immaterial property is well put by Mr. R. A. Macfie, in a paper read before a recent Social Science Congress. He says:—

> Take the case of a man who reclaims and occupies or uses a piece of land. If anybody besides intrudes, and proceeds to cultivate it, he interferes with this prior occupant. Both cannot have the full enjoyment of it, or of its fruits. But if that which the man reclaims and uses be something he makes available from the unexplored or waste parts of the world of *mind*—as, for instance, a *method* of improving land, and rendering it productive—ten thousand other persons may appropriate and enjoy it as fully as he himself does, without the smallest intrusion on their part, or any interference of one with another.
>
> Or, take the illustration in a slightly different form:—A man makes and uses a plough. It cannot be used at the same time by his neighbour. But if he invents a new *kind* of plough, all his neighbours may make ploughs similar, without injuring him—that is without taking his property—viz., the particular plough he made.
>
> The difference arises from the constitution of things. It has pleased the Creator, who knows what is good for man, and what are the limits within which the tendency to prefer self may be permitted, to draw a broad line of distinction between things material and things immaterial. Things material He renders incapable of being appropriated by a number of persons without the share of each person being less than the whole. Joint participation in these is obtainable only by abstraction of something from a previous possessor; whereas in things immaterial—ideas, principle, modes—joint participation involves no abstraction.
>
> Again: as a number of persons cannot simultaneously or jointly use the same land, the same plough, or any other material thing, without directly affecting the use, or profit, or convenience of the original owner, it is evident they cannot by any joint use add to the *public wealth* more than this one owner's exclusive use would (supposing always that he makes the best and utmost use of it); whereas, in things immaterial, by simultaneous use (which, as we have seen, according to the wise and happy constitution of things, is possible and beneficial) the public wealth increases in proportion to the number of persons participating.

And we may add that in matters of art the general culture and progress in refinement increase in proportion to the number of persons participating; and those persons who receive especial state privileges, such as we shall show copyrights to be, on the condition and for the express purpose that they may diffuse ideas, do a wrong to the community if they refuse such diffusion themselves and oppose it in others.

But it may be answered that this mode of argument strikes at the very root of copyright and property in ideas. But this is a mistake. It only points out and emphasises the distinction between the kinds of property in which a man possesses a sole and absolute moral right, and that kind of property in which the State, for purposes of expediency gives him a conditional monopoly. All a man's ideas, as well as his tangible property are his own. He may retain them for his own use, profit, or employment; but the moment they are published they are no longer his own exclusively. He cannot produce light without others being illuminated, unless he close doors and windows. But this being the case, the motive of personal profit from the publication of ideas being wanting, many good thoughts, many beautiful designs would never be published, and the state has deemed it expedient to create a kind of property called copyright, which gives to the originator of ideas a property in them for a stated period and on stated conditions. The only moral right the author had in his ideas was to keep them for his own use without publication; the statute creates a further right, but it defines its conditions and limits. If, as "J. S. W." imagines, these designs are individual property by moral right, and statutes are merely passed for the more convenient defence of such property, how is it that the protection is only given for a limited period? A man's purse is his property always, not simply for a period of fourteen or twenty-eight years. But the monopoly of an idea is only conferred on its originator for a limited period and on certain conditions; and that not of absolute right but from motives of expediency. If the conditions are not complied with, the natural conclusion is that the copyright has been abandoned and become public property. If the arguments of some of our correspondents have any weight at all, they have just as much against copying the oldest non-copyright engravings as well as the most modern, for it may be argued they were designed and engraved by somebody, and somebody must have property in such design.

On the score of moral claims, morever, the printsellers do not approach the matter with clean hands. Having abandoned their copyright by disregarding the conditions upon which it is held, and that too frequently for the purpose of making an unfair profit by selling an enormous number of proofs, they are not in a condition to complain of the loss of such copyrights. They have disregarded real moral rights too flagrantly to receive much sympathy when they put forward spurious claims. They have too often made groundless demands for their assumed moral rights in an unscrupulous manner to receive much attention. Here is an example: the following letter received a few weeks ago details a mode of proceeding which we are happily not called upon to characterise:—

"52 *Shurlock St., Birmingham.*

"Sir,—Knowing that you are interested, as all photographers are more or less, in the copyright question, must be my excuse for troubling you with a statement of my case, and when you have read it, I think you will agree with me that a more scandalous case was never brought under your notice, or one more deserving the sympathy of the profession. I am a photographer carrying on the profession at the above address, and to eke out a living sell a little stationery and other things. A few days ago I received a circular from the solicitor to the Association for the Protection of Copyright in Engravings—a Mr. Bowen May, of Russell Square—saying that I had sold and exposed for sale pirated copies of certain engravings, viz., "The Motherless Bairn," and "Home and the Homeless." I replied to the circular in rather warm terms, demanding an apology by return of post, as I was perfectly innocent. The reply I received was a copy of a writ at the suit of Henry Graves. I did not accept the service by post, so I was served personally with one, and was compelled yesterday to find money to put in an appearance against it, or suffer my few goods to be swept off and be turned a beggar into the streets, for an offence which I never committed, and have respectable witnesses to prove I never did commit: in fact, I have never copied engravings for sale, neither have I ever sold copies of these said prints, either photograph or lithograph. Now, sir, after this brief statement of my case, I think you will say that it is a shame and a disgrace to the print publishers to prosecute a man in my position for an offence which I have never committed, and if it is carried to trial will most likely result in ruin to me, because I am not in a position to defend this rascally action.—I am, sir, yours most respectfully,

"C. Harris.

"*Feb. 3rd*, 1865."

Is it not very clear that an association for protection from such attacks is an absolute necessity?

Let us not be misunderstood. We repeat most emphatically that we have no sympathy with those who disgrace our art by piracy. Where it can be shown that the proprietor of an engraving or picture has, in any manner, signified his intention to avail himself of the provisions of the statute conferring copyright, even if some accidental informality in the mode occurred, we should recommend that his property be held sacred, but where these provisions are wantonly, and for profitable considerations disregarded, and the copyright has thus been adandoned, we cannot join in the outcry against photographic copies of such pictures as piracies.

Let this fact also be well understood; if the arguments used by "J. S. W." and "* *" be of any avail at all, and the mere fact of a design existing implies that the property belongs to some one who has a "moral right" to it, an immediate stop must be put to all photographic reproductions. The owners of modern copyright pictures decline to reproduce them by photography, and old pictures must not be touched, lest the "moral rights" of some unknown owner be violated. Nothing, we apprehend, more fully establishes the folly of the argument than the fact that logically followed it leads to an absurdity.

In the interest of photography, of cheap art, and of the print publishers themselves, we once more urge them to destroy actual piracy by issuing authorised photographic reproductions of their pictures, and instead of railing at the copyists of the pictures in which they have forfeited their copyrights, rival them in issuing cheap and excellent photographic copies, with all the prestige which their position and business relations will command.

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Critical Notices.

THE YEAR BOOK OF PHOTOGRAPHY, and Photographic News Almanac for 1865, Edited by G. Wharton Simpson. London: Office of the Photographic News, Paternoster Row.

For obvious reasons we cannot undertake to pass any opinion upon this work beyond giving a brief notice of its purpose and contents. Its aim is to furnish photographers with a complete compendium of the progress of their art during the past year. To do this efficiently, it is found desirable in regard to all the important processes in common use to re-state the various details embodying the minor improvements and modifications in formulæ and manipulations, which have been tested and approved in the daily practice of the ablest photographers. And in regard to the special novelties, discoveries, and inventions of the year, succinct accounts are rendered, briefly or at length, according to their importance. An important feature consists in the introduction of original articles, by able photographers, on especial subjects, in regard to which frequent and ready reference is desirable. Of the excellence of these articles one may speak without reserve, and commend them to the attention of our readers. Mr. H. P. Robinson contributes "What to avoid in Card Portraits;" Mr. V. Blanchard describes a valuable method of "Reproducing and Enlarging Negatives," and "Hints for Out-door Photography;" and Mr. W. W. Woodbury describes a successful mode of "Solar Printing by Development." For the rest there is the usual matter of an almanac with all information regarding the various Photographic Societies, their officers, days of meeting, &c, Annals of Photography for 1864; the preparation and management of collodion, nitrate bath, developing, intensifying and fixing solutions; silver printing and gold toning processes; uranium, iron, and carbon printing processes; the magnesium light; the use of stops; recovery of silver; enlarging processes; all the dry processes and all the proposed new processes; patents, &c., of the year, together with a mass of other matter.

THE PHILADELPHIA PHOTOGRAPHER: a Monthly Journal devoted to Photography. Philadelphia: Benerman & Wilson; London: Trübner, Paternoster Row.

America was the birth place of photographic journalism, and it is pleasant to observe that amid the political dissentions which agitate the States, their photographic literature steadily progresses. For many years, two excellent transatlantic Photographic Journals have flourished; and last year another commenced, having some decidedly new features. *The Philadelphia Photographer* appears monthly, and each number is graced with an excellent photograph, generally about 6 by 4, mounted on plate paper, with an India tinted margin, always worth more than the price of the whole Journal. Some of those which appeared during the year, forming the completed volume before us, are most charming pictures, and admirable illustrations of the capabilities of our art. Then the magazine is besides a perfect triumph of typography, so beautifully printed on such excellent paper. We have mentioned the material characteristics first, not because there is any lack of excellence in the literary matter, but because they were the most novel. Our readers have already seen the class of articles in the occasional extracts we have made from its pages. Mr. Coleman Sellers, whose name is well-known on this side of the Atlantic, contributes some excellent practical articles; Mr. Carey Lea, besides original scientific articles, contributes an admirable resumé, with comments of the progress during the month at home and abroad; the Rev. Mr. Taylor some pleasant essays on photographic topics. Reports of the Philadelphia Photographic Society, good selected articles, and able editorial notices, complete a high-toned, and excellent photographic magazine.

EBURNEUM PHOTOGRAPHS. By J. Burgess, Norwich.

We have before us a number of portraits by a new process, the invention of Mr. Burgess, of Norwich, which he has designated the eburneum process, from the resemblance of the material on which they are produced to ivory, both in colour and transparency, whilst in delicacy of texture and surface, and perfect homogeneicty of grain, it is superior to ivory. Nothing can exceed the extreme delicacy of the gradations and the effect of perfect finish in the pictures; the tones vary from black or grey to a warm brown, and the result generally resembles a very fine enamel.

We cannot, unfortunately, enter into any details of the process, as Mr. Burgess, having spent some time and money in making out his process, is desirous of re-imbursing himself by teaching his brethren the mode of preparing the material and working the process for a consideration. We can simply say that the manipulations do not appear difficult, the exposure very short, the results exceedingly beautiful, and probably permanent. It is an ingenious adaptation of a well-known process to a new purpose and on specially prepared material. We should think that, as a novelty in portraiture, it will create a demand at a good price.

THE AMERICAN PHOTOGRAPHIC ALMANAC for 1865, Edited by John Towler, M.D., &c., &c. New York: J. H. Ladd. London: Trübner & Co.

This is a most admirable compendium of photographic information on a plan similar in many respects to that adopted in our own Year-Book. It is a complete repertory of processes, recipes, and hints for every department of photography, written in a clear vigorous style, with a sufficient dash of liveliness to prevent interest flagging through the instructions becoming dreary. Here is an example of the Editor's advice to an intending pupil, a correspondence with whom introduces the matter which follows:—

> My Dear Sir,—If you can shave and wash yourself before breakfast, and neither smoke nor chew; if you can make a charcoal fire, and sweep out the laboratory before six o'clock in the morning; if you do not hesitate to carry a pail of water through the street, or drag a photographic hand-cart up a precipitous declivity; if you can run with a wet plate for half a mile in five minutes through brakes and brambles, without shuddering at the idea of rattlesnakes or black serpents; if you do not scruple to ascend or descend crags overhanging death-like abysses, without the slightest conception of your soul being severed from your body; if you can feed on crackers, cheese, and spring-water for a whole day without any craving for city delicacies, if you can bear to see a whole tour's labour shattered to atoms in the cars, without swearing; in fine, if you are determined to make photography your hobby, I will condescend to allow you to enter my sanctum, and to partake of my instructions. You must be truly an enthusiast in the art, and earnest in the undertaking, if you wish to enjoy my friendship and reap profit from our intercourse. A milk-and-water man is none for me; and your money I care not for; but I do care for an earnest determination to conquer difficulties, an honest enthusiasm of character in every undertaking to ferret out nature's secrets, and a soul devoid of all petty venalities. I am neither politician nor tradesman, know neither the price of potatoes nor butter, much less the value of my own knowledge; but I know how to estimate congeniality of sentiments, and to measure out information by the bushel to those who seek it in the proper spirit, which is a spirit engendered alone by the love of nature's laws and beauties. If you are of the right stamp, I will write for your instruction and superintend in person your practical development in the most charming of all arts.

Having secured an earnest pupil, the Editor proceeds to give him nearly a hundred and fifty pages of excellent instruction, of which we recommend our readers also to avail themselves.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Glass Houses.—The Copyright Question.—Double Imaged Cartes de Visite.—Exhibition of the Photographic Society of Scotland.—The Guarantee Fund. The Societies.—The Photographic Field Club.

The subject of glass houses is one of vital importance to photographers, and one upon which much has been written. As this is a growing time of year for this sort of produce—preparations being now made for the coming photographic campaign—I take the opportunity of having my say on the subject. It has been the fashion lately to run after any new form that may be suggested, and many costly experiments have been made in tunnel-shaped and other varieties, simply because one or two photographers who could produce good pictures, no matter under what circumstances, have chosen to depart from the good old gable ended or "lean to" buildings, and have allowed their craving for novelty to lead them into eccentricities they would gladly be rid of. The germ of these contrivances was suggested by Mr. Sutton. In principle it was in many respects capital, and in some cases worked well. It is difficult to describe, but it is scarcely necessary to do so, as many of my readers have had so much practical experience of the inconvenience of its indiscriminate adoption, that they know more about it than they care to think of. The novelty consisted in its being a glass-house built almost without glass. Except in favourable positions it was so dark that there was but little possibility of getting a picture in it on any but very bright days, and the range of effects was limited, top front light being in excess. Photographers have an itching for modifications, and modifications, therefore, set in. Every conceivable variation has been resorted to, to waste the money and spoil the temper of photographers. The last I noticed was built accordion fashion, MacLachlan's blinds gone mad, in fact. The end of it all is that every photographer who can afford it is taking down his new invention, and returning to the old-fashioned oblong glass room with ridge roof—in my opinion, by far the best form of studio possible; and I am glad to hear that Mr. Hughes, who is now building, at Ryde, what promises to be the most perfect and beautiful photographic establishment in the kingdom, is constructing his glass rooms on this principle.

The war of words in the matter of Copyright in Engravings still furiously rages. "Detector" and "J. S.W." being the chief combatants, with occasional assistance from free lances, who jump about on the outskirts of the battle, and take a dig at whichever of the principals they most object to, when they see their opportunity. "The subject," as every chairman remarks when he is hard up for something to say on the last thing brought before the meeting, "is a most interesting one;" but is it not just possible to have too much of a good thing? I thought I had a clear idea of the subject a month ago, but so much argument is confusing. One conclusion I have come to is, that it may be wise, but it is neither brave nor manly of the printsellers to prowl about the back slums of the trade, picking out and prosecuting the unfortunate small shopkeepers, who cannot afford to defend themselves. Why don't they hit some one of their own size, and try the matter fairly out?

"The latest thing out" in photography are Cartes de Visite containing two portraits of the same person on one card. These are not taken by any process of double printing, as might be supposed, but the negative with the double image is produced complete in the camera. I saw one of these prints by a Paris photographer, who kept the method of producing them secret, in November last; since that time the process of their manufacture has been described by Mr. G. R. Gill in England, and by Professor Towler, in America. Their papers on the subject will be found in the number of the News for Feb. 10. I have seen a considerable number of Mr. Gill's productions, and very curious results he has obtained. Not the slightest indication of a join is to be detected on a perfectly plain back-ground, perhaps the most rigid test that could be applied. The most singular effect on looking at the picture is that if you recognize the one image as the portrait of your friend, you wonder who the other is; if the expression has varied much, the difficulty is increased. Some of Mr. Gill's pictures exhibit a quaint fancy rarely seen in photographs.

The exhibition of the Photographic Society of Scotland closed on the 18th. The result, as far as pecuniary considerations are concerned, being, I regret to say, a failure. It is some consolation to know that the Society was prepared for, and expected, a loss, so that it cannot be called a disappointment. "'Tis not in mortals to command success," but all that an energetic and popular secretary could do to ensure success was done: the collection was one of the finest ever got together; the fault, therefore, really lies with the public. If they will not give sixpence to see the best results of the united efforts of nearly all the best photographers during the year, it is their loss, the photographers have done all in their power to entertain them. We know that free admission and refreshments will attract a crowd. Will photographic exhibitions, which we might almost call national, have to resort to these devices to secure patronage? One thing is certain, *photographic exhibitions must not be given up*, the life of the art depends, in a great measure, on the encouragement they give to the best artists to produce the best works. The best work has never yet been done with a view to the money that could be made by it; commerce, therefore, is not a sufficient incitement to exertion. The love of the thing itself, and the pleasure of exhibiting the accomplished results, are more potent arguments in favour of producing excellence than any commercial consideration.

The failure of recent photographic exhibitions point to the necessity of the establishment of guarantee funds, as advocated in a recent number of the News. The average loss on the London exhibitions is under £100. It can scarcely be a difficult matter to raise this amount amongst the wealthy followers of the art.

The annual meeting of the Photographic Society of London, took place early in the month, and the officers for the ensuing year were elected. The President, the Lord Chief Baron, astonished and delighted the meeting with a speech full of erudite observations, delivered in the clear and finished manner for which he is famous; and, what pleased the meeting perhaps more, he announced that he would use all his endeavours to secure, if possible, apartments in Burlington House, as a place of meeting for the Society. An important Society like the Photographic has surely as much claim on the consideration of the Government as many learned bodies now located there. The accounts showed that bankruptcy was not so near as those who would damage the Society have endeavoured to prove, but that it was absolutely in a state of comparative prosperity; the one great loss being on the exhibition; money in the opinion of the majority, well spent.

The report of the Council might have been more complete without being tedious; it might have given us some record of the progress of photography during the year, not perhaps that it is strictly necessary that the Council should mention anything that occurred in the art apart from its own proceedings, but being the representative society we look for a completeness in its annual report which we miss in the present one.

It may save members of the Society trouble to remind them that the day of meeting has been altered from the first to the second Tuesday in the month, therefore the next meeting will be on the 14th of March.

The South London Society listened with great attention to an interesting paper on "The Wothlytype Process," by Mr. H. Cooper, jun., who seems to have made this subject specially his own. The great treat of the evening was the exhibition of a collection of photographs by Mr. Mudd, of Manchester, taken by the collodio-albumen process. They certainly reached the highest point of absolute perfection. To say less would not be doing them justice. Every "dry man" has his pet process, but a sight of these beautiful prints made one wonder why any other process than the collodio-albumen should ever have been attempted. This is another instance, I suppose, of it being the man and not the method that produces perfect work. Mr. H. P. Robinson, exhibited a printing frame which had been used by Dr. Diamond early in 1839, the year in which Mr. Fox Talbot first introduced the Calotype. In doing so he took occasion to mention some of the great benefits the Doctor had conferred on photography. He probably has not made any great inventions, or propounded any crude and foggy theories, or bewildered the brains of photographers with suggestions apparently impossible to carry out, but enabling the suggestor to claim the discovery if worked out by more skilful hands at a later period; but Dr. Diamond is an eminently practical man, and has been able to produce good pictures when others have been hopelessly groping in the dark. Not only this, but he has a way of conveying his knowledge to others in such a lucid style, as to have removed years of labour from the path of beginners, and this in such a modest and quiet manner that you never knew when you were receiving a favour from him. The great have no belief in their own greatness, it is so with Dr. Diamond; he might say with Lancelot;

> "In me there dwells
> No greatness, save it be some far off touch
> Of greatness to know well I am not great."

If the converse of this be true, I will leave it to others to designate the spirit which dictated a captious letter in a contemporary, asking what Dr. Diamond had done in photography.

The North London Society had no paper, owing to the gentleman who had promised one not being forthcoming. This is a nuisance that societies should strive hard to guard against, and it would be only fair for defaulters to give as long a notice as possible of their inability to attend. This being the meeting preceding the annual gathering, officers were proposed for the coming year. It gives interest to the proceedings when members elect their own officers, and I am glad to see that an election will take place next month, more names being proposed on the list of Vice-Presidents and the Committee, than there are vacancies. Mr. Bedford sent a superb collection of his landscape photographs, for exhibition; which more than compensated for the absence of the promised paper.

Nothing of any importance has occurred in the provincial societies during the month, annual meetings being very prevalent. The Manchester Society would perhaps carry off the palm for liveliness; Mr. Johnson having exhibited his admirable pantascopic camera at the January meeting, its claims to novelty met with a violent—or virulent, which is the word—opposition, the details of which are hardly worth entering into; suffice it to say, that a member wished to give all the merit of the invention to Mr. Sutton. It curiously happens that Mr. Sutton has never made the least claim to this invention, or offered any opposition to it, although it must have interfered with his own invention for the same object; on the contrary—and this was a piece of generosity worthy of note and imitation—he has called it a "right down good sound useful invention," and welcomed its appearance in the most cordial manner.

At the other Manchester Society — the Literary and Philosophical—Mr. Brothers called the attention of the meeting to a translation of a supposed original Greek Codex, which ascribes the invention of Daguerreotype to the ancients, translated by Dr. Constantine Simonides. I am glad to see Mr. Brothers placed very little faith in Dr. Simonides' wonderful discovery, which is now generally regarded as an impudent, but clever forgery. Mr. Sidebotham supplied an interesting paper on "Certain Phenomena connected with the Perspective and Measurement of Photographic Pictures."

The Glasgow Photographic Association gave an evening to the pantascopic camera: the chairman suggested that one should be bought for the occasional use of all the members, in which proposition I think there is a great deal of practical common sense.

At the Historic Society of Lancashire and Cheshire, Mr. J. T. Towson read a paper on "The History of Photography down to 1840," which subject would seem to many readers parallel to a pre-Adamite history of mankind. It appears certain that an interesting history of the progress of photography before the time of Talbot and Daguerre might be written. Beginning with the alchymists, our modern experience would appear but as an episode in such a history.

The secretary of the South London Society has proposed the formation of what should be a very pleasant and agreeable little club. He suggests that a club should be formed consisting of amateur photographers, the objects of the society to be similar to the sketching clubs of amateur water-colour painters. Out-door meetings would be held during the summer, when every member would be expected to take his camera. Working members, only, are required.

PICTURES OF NIAGARA.

Taken with Camera, Pen, and Pencil.

BY J. WERGE.

Many very beautiful and interesting photographic views of Niagara Falls, and other places of romantic and marvellous interest, have been taken and exhibited to the world. Indeed, they are to be seen now in almost every printseller's window; and in the albums, stereoscopes, or folios of almost every private collector. But I question very much if it ever occurred to the mind of anyone, while looking at those pictures, what an amount of labour, expense, and danger, had to be endured and encountered to obtain them—"the many hairbreadth 'scapes by flood and field," of a very "positive" character, which had to be risked before some of the "negatives" could be "boxed." Doubtless, Mr. England, Mr. Stephen Thompson, and Mr. Wilson have many very vivid recollections of the critical situations they have been in, while photographing the picturesque scenery of the Alpine passes of Switzerland, and the Highlands and glens of Scotland.

Mr. Stephen Thompson has narrated to me one or two of his "narrow escapes," while photographing his "Swiss scenes," and I am sure Mr. England did not procure his many and beautiful "points of view" of Niagara Falls without exposing himself to considerable risk.

I had the good fortune to be one of the earliest pioneers, in company with a Yankee friend, Mr. Easterly, in taking photographs of the Falls; and my recollections of the manner in which we "went about," poised ourselves and cameras on "points of rock" and "ledges of bluffs," and felled trees, and lopped off branches overhanging precipices, to "gain a point," even at this distant date, are somewhat thrilling. To take a photograph of what is called "Visitors View," is safe and easy enough. You might plant a dozen cameras on the open space at the brink of the "American Fall," and photograph the scene, visitors and all as they stand, "fixed" with wonder, gazing at the Falls, American, Centre, and Horseshoe, Goat Island, and the shores of Canada included, for this point embraces in one view all those subjects. But, to get at the out-of-the-way places, to take the Falls in detail, and obtain some of the grandest views of them, is a very different matter.

I remember, when we started, taking a hatchet with us, like backwoodsmen, to take a view of Prospect Tower, on the American side of the great Horseshoe Fall, how we had to hew down the trees that obstructed the light; how we actually hung over the precipice, holding on to each other's hands, to lop off a branch still in sight where it was not wanted. The manner in which we accomplished this was what some bystanders pronounced "awful." I hugged a sapling of a silver birch, growing on the brink of the precipice, with my left arm, while friend Easterly, holding my right hand with one of the Masonic grips—I won't say which—*hung over* the precipice, and stretching out, as far as he could reach, lopped off the offending branch. Yet in this perilous position my lively companion must crack his joke by punning upon my name, and a Cockney weakness at the same time, for "he guessed he was below the *werge* of the precipice." The branch down, and we had resumed our perpendicular positions, he simply remarked, "if that was not holding on to a man's hand in *friendship*, he did not know what was."

But the *work* was not done yet, to get the view of the Tower we wanted, we had to make a temporary platform over the precipice. This we managed by laying a piece of lumber across a fallen tree, and unshipping the camera, shoved it along the plank until it was in position, balancing the shore end of the plank with heavy stones. When all was ready for exposure I went round and stood on the point of a jutting rock to give some idea of the great depth of the Fall, but that I very nearly discovered, and just escaped being myself the plummet. In the excitement of the moment, and not thinking that the rock would be slimy and slippery with the everlasting spray, I went too rapidly forward, and the rock having a slight decline, I slipped, but was fortunately brought up by a juniper bush growing within a foot of the edge. For a second or two I lay on my back wondering if I could slide out of my difficulty as easily as I had slidden into it. In a moment I determined to go backwards on my back, hands, and feet, until I laid hold of another bush, and could safely assume the position you see me in, in the view of Prospect Tower, from Goat Island. After giving the signal that "all was right," the plate was exposed, and I *cautiously* left a spot I have no desire to revisit. But it is astonishing how the majesty and grandeur of the scene divests the mind of all sense of fear, and to this feeling, to a great extent, is attributed the many accidents and terrible deaths that have befallen numerous visitors to the Falls.

The Indians, the tribe of the Iroquois, who were the aboriginal inhabitants of that part of the country, had a tradition that the "Great Spirit" of the "Mighty Waters" required the sacrifice of two human lives every year. To give rise to such a tradition, doubtless, many a red man, in his skiff, had gone over the Falls, centuries before they were discovered by the Jesuit missionary, Father Hennepin, in 1678, and, even in these days of Christian civilisation, and all but total extirpation of the aboriginals, the "Great Spirit" does not appear to be any less exacting. Nearly every year one or more persons are swept over those awful cataracts, making an average of at least one per annum. many visitors and local residents have lost their lives under the most painful and afflicting circumstances; the most remarkable of which occurred just before my visit. One morning, at daylight, a man was discovered in the middle of the rapids, a little way above the brink of the American Fall. He was perched upon a log, which was jambed between two rocks. One end of the log was out of the water, and the poor fellow was comparatively dry, but with very little hope of being rescued from his dreadful situation. No one could possibly reach him in a boat. The foaming and leaping waters were rushing past him at the rate of eighteen or twenty miles an hour, and he knew as well as any one that to attempt a rescue in a boat or skiff would be certain destruction, yet every effort was made to save him. Rafts were made and let down, but they were either submerged or the ropes got fast in the rocks. The life-boat was brought from Buffalo, Lake Erie, and that was let down to him by ropes from the bridge, but they could not manage the boat in that rush of waters, and gave it up in despair. One of the thousands of agonized spectators, a Southern planter, offered a thousand dollars reward to any one that would save the "man on the log." Another raft was let down to him, and this time was successfully guided to the spot. He got on to it, but being weak from exposure and want, he was unable to make himself fast or retain his hold, and the doomed man was swept off the raft and over the Falls, almost instantly, before the eyes of thousands, who wished, but were powerless and unable to rescue him from his frightful death. His name was Avery. He and another man were taking a pleasure sail on the Upper Niagara river, their boat got into the current, was sucked into the rapids, and smashed against the log or the rock. The other man went over the Falls at the time of the accident; but Avery clung to the log, where he remained for about eighteen hours in such a state of mind as no one could possibly imagine. None could cheer him with a word of hope, for the roar of the rapids and thunder of the cataracts rendered all other sounds inaudible. Mr. Babbitt, a resident photographer, took several daguerreotypes of the "man on the log," one of which he kindly presented to me. Few of the bodies are ever recovered. One or two that went over the Great Horse Shoe Fall, were found, their bodies in a state of complete nudity. The weight or force of the water strips them of every particle of clothing. But that is not to be wondered at, considering the immense weight of water that rolls over every second, the distance it has to fall, and the depth of the foaming cauldron below. The fall of the Horse Shoe to the surface of the lower river is 158 feet, and the depth of the cauldron into which the Upper Niagara leaps about 300 feet, making a total of 458 feet from the upper to the lower bed of the Niagara River at the Great Horse Shoe Fall. It has been computed that one hundred million, two hundred thousand tons of water pass over the Falls every hour. The depth of the American Fall is 164 feet; but that falls on to a mass of broken rocks a few feet above the level of the lower river.

Our next effort was to get a view of the Centre Fall, or "Cave of the Winds," from the south, looking at the Centre and American Falls, down the river as far as the Suspension Bridge, about two miles below, and the Lower or Long Rapids, for there are rapids both above and below the Falls. In this we succeeded tolerably well, and without any difficulty. Then descending the "Biddle Stairs" to the foot of the two American cataracts, we tried the "Cave of the Winds" itself; but, our process not being a "wet" one, had no sympathy with the blinding and drenching spray about us. However, I secured a pencil sketch of the scene we could not photograph, and afterwards took one of the most novel and fearful shower-baths to be had in the world. Dressed, or rather undressed for the purpose, and accompanied by a guide, I passed down by the foot of the precipice, under the "Centre Fall" and along a wet and slippery pole, laid across a chasm, straddling it by a process I cannot describe, for I was deaf with the roar and blind with the spray, we reached, in safety, a flat rock on the other side, and then stood erect between the two sheets of falling water. To say that I saw anything while there would be a mistake, but I know and felt by some demonstrations, other than ocular, that I was indulging in a bath of the wildest and grandest description. Recrossing the chasm by the pole, we now entered the "Cave of the Winds," which is immediately under the Centre Fall. The height and width of the cave is one hundred feet and the depth sixty feet. It takes its name from the great rush of wind into the cave, caused by the fall of the waters from above. Standing in the cave, which is almost dry, you can view the white waters, like avalanches of snow, tumbling over and over in rapid succession. The force of the current of the rapids above, shoots the water at least twenty feet from the rock, describing, as it were, the segment of a circle. By this circumstance only, are you able to pass under the Centre Fall; and a portion of the Horse Shoe Fall on the Canadian side. To return, we ascended the "Biddle Stairs," a spiral staircase of 115 steps, on the west side of Goat Island, crossed the latter, and by a small bridge passed to Bath Island, which we left by the grand bridge, which crosses the rapids about 250 yards above the American Fall. Reaching the American shore again in safety, after a hard day's work, we availed ourselves of Mr. Babbitts kindness and hospitality to develop our plates in his dark room, and afterwards developed ourselves, sociably and agreeably, refreshing the inner man, and narrating our day's adventures.

(*To be continued.*)

CARBON TRANSPARENCIES FOR THE MAGIC LANTERN.

BY WALTER WOODBURY.

Very beautiful transparencies for the lantern may be made, in any colour, by the following method:—Procure a few sheets of talc, about 3½ inches square, and place, say 4 or 6, on a sheet of plate glass 8 by 10, or 10 by 12, having damped them to make them adhere, and letting the edges join. Next, prepare a solution of bichromated gelatine and colour similar to that used for Swan's carbon process, but with a much greater proportion of colouring matter, else the resulting image will be too thin and weak. Coat the sheets of talc with this solution, and allow to dry. Next, strip the sheets from the glass, and expose talc side to the negative, and wash in warm water, similar in every respect to the carbon process. The result will be a fine transparency on the talc, which may be mounted by covering or cementing to a piece of glass same size.

Talc in squares of the size suitable may be procured for 2d. or 2½d. per sheet, so that the cost would not be more than for patent plate glass; and the trouble of preparing and printing is not so great as that of tannin or other dry plates.

The talc in this takes the place of the collodion in Swan's process, over which it possesses many advantages; and were it not for the expense, it might be used advantageously for carbon printing on paper, as it could be mounted on the paper either way, and would give an enamelled surface to the finished print. By this method, carbon transparencies on glass may be produced with as little trouble as prints on paper.

MODIFIED IRON DEVELOPER.*

A MIXTURE OF THE SULPHATE OF IRON AND THE DOUBLE SULPHATE OF IRON AND AMMONIUM.

During a course of experiments in photography in the laboratory of our friend, and a friend of the art and science of photography, Henry P. Martin, Esq., of Albany, we had an opportunity of testing the efficacy of the developer, consisting of the simple sulphate of iron and ammonium, and of a mixture of the two. The result of these experiments was, that with the last mentioned developer we were enabled to obtain intensity in the negative that required very little or no strengthening afterwards. The formula stands as follows:—

Protosulphate of iron	2 drachms
Double sulphate of iron and ammonia	2 „
Water	16 ounces
Acetic acid	4 „
Alcohol	1½ „

Pulverize the two salts, then dissolve and filter. If any fogging supervene before the proper intensity has been attained, add more and more water, according to the time of exposure. There is always a certain balance to be observed or ascertained between the time of exposure and light on one side, and the acid and iron salt in the developer on the other. If the light is bright, and the exposure very short, the iron salt preponderates, and in some instances there is no acid at all required. This plan is followed in the production of instantaneous pictures, much iron salt, but little acid, and the time of development short, the remaining part of the development being performed after fixing, by the intensifying process. Such pictures must of necessity be harsh; of necessity so by such a mode of development; supposing, however, that the actinic impression has been powerful enough to produce a latent image containing detail, then we must change our developer and make it sufficiently strong, but control the rapidity of action by means of acid. The formula just given will then be found of great value, and especially with the addition of an ounce more of acid. It is seldom, however, that much detail can be obtained by a very short exposure, there is consequently a limit as to time, which can be ascertained only by experience. When the right time has been discovered, the next experiments must aim to arrange the amount of iron salts to the acid, by means of which the proper intensity can be obtained by the first development.

How are you to ascertain the requisite amount of the salts to the acid? you ask.

As follows:—

Case 1.—The picture comes out with *very great* rapidity. The developer is much too strong. Diminish the quantity of iron salt and try again.

Case 2.—The picture appears with less rapidity, but the high lights begin to be fogged before the shades are opaque enough.

How are you to know when the high lights begin to be fogged? is your next question.

When they cease to be white or cream-like, by reflected light, and assume a greyish blue tone, and become somewhat cloudy by transmitted light, then the shades and lights have attained their greatest contrast, for, from this moment they gradually receive the same amount of deposit by reduction.

What are we to do in such a case?

Add more acid to the developer, in order to keep back the lights from receiving any deposit until the shades are opaque enough. Keep adding more acid in each succeeding experiment until the desired depth of intensity in the shades has been attained, without fogging of the highest lights.

How are you to know when the shades are intense enough?

This you can ascertain only from your experience in printing. Take, for instance, any negative, and, holding it up before the eyes and between them and the window, see if you can distinguish easily the bars of the window frame through the most intense shades. If you can, these shades are not intense enough. Or, if you can distinguish apart the leaves of a tree or the letters on a page of print through these shades, they are certainly not dense enough; for, in printing, the paper will not be white beneath such shades.

Learn, therefore, the proper opacity required, and carry the conception of this opacity with you into the developing room. This is called the result of experience, which is always the result of time. We can tell you all the conditions required, and the mode by which these conditions can be obtained; but we cannot guarantee your success, for this depends upon experience, and experience may be long or short according to the amount of your reading and thinking qualities, and the nicety and accuracy of your manipulations, all of which properties depend on the idiosyncrasy of the individual; for it is not every one that is born covered with a caul nor with a silver tea-spoon in his mouth.

ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

Photo-Galvanography.—Without the collodion film, Mr. Paul Pretsch's photo-galvanographic process of engraving would not have existed, as light could not be transmitted through the daguerreotype plates, and the paper processes of Mr. Fox Talbot and others would have been inadmissible. Mr. Pretsch knowing that gelatine, if treated with bi-chromate of potass, and submitted to the action of light, possessed a power of expansion, and, availing himself of that fact, used a photographic image taken on collodion as a means of partially intercepting the rays of light, thereby regulating their action upon sensitised gelatine, and as a result he obtained a positive photographic image in relief in gelatine. The image, being allowed to dry, was then coated with black lead, and served as a mould in relief upon which to deposit, and from which he obtained, by electro-deposition, an engraved copper-plate of the original collodion photograph, from which plate-prints could be taken as in ordinary copper-plate printing; and it is right to add that some of the best specimens of prints from chemically-engraved plates ever seen were so obtained and introduced into commerce. But the fault which attached to the aquatint and mezzotint processes of engraving, also attached to Mr. Pretsch's process, viz., the surface or grain of the plate was too fine to yield a large number of good impressions, and that is, no doubt, one of the many causes which have impeded its extended use. The acierage process of M. Joubert for coating copper plates with an iron surface (described below), was not introduced at the time Mr. Pretsch was working his invention. Mr. Pretsch succeeded in producing surface blocks by his photo-galvanographic process. In order to obtain a surface block, it must be borne in mind that the process, as compared with the intaglio plate, is reversed. In the engraved plate the impression is printed from the lines cut into the plate; but in the case of all surface blocks, it is the portions which are not to be printed from which have to be removed by the graver. In like manner Mr. Pretsch used a negative photograph in one case, and a positive in the other, thus reversing his results.

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* From *Humphrey's Journal.*

* Continued from page 92.

Acierage.—The acierage process is thus described by M. Joubert:—

"My invention has for its object certain means of preparing printing surfaces, whether for intaglio or surface printing, so as to give them the property of yielding a considerably greater number of impressions than they are capable of doing in their ordinary or natural state. And the invention consists in covering the printing surfaces, whether intaglio or relief, and whether of copper or other soft metal, with a very thin and uniform coating of iron, by means of electro-metallurgical processes.

"It having become a desideratum to harden, if possible, the surface of a copper plate, and to protect it from wear while printing, in March, 1848, my friend, M. Jacquin, of Paris, took out a patent in this country for a method of coating plates with iron, which had already been successfully applied in France, and of which the merit is due to my friend, M. Henri Garnier, of Paris.

"I have myself had the advantage of co-operating with M. Garnier in the development of the invention, the principles of which I shall now proceed to describe:—

"If the two wires of a galvanic battery be plunged separately into a solution of iron, having ammonia for its basis, the wire of the positive pole is immediately acted upon, while that of the negative pole receives a deposit of the metal of the solution—this is the principle of the process which we have named 'acierage.'

"The operation takes place in this way:—By placing at the positive pole a plate or sheet of iron, and immersing it in a proper iron solution, the metal will be dissolved under the action of the battery, and will form hydrochlorate of iron, which, being combined with the hydrochlorate of ammonia of the solution, will become a bichloride of ammonia and iron; if a copper plate be placed at the opposite pole and likewise immersed, the solution being properly saturated, a deposit of iron, bright and perfectly smooth, is thrown upon the copper plate, from this principle:—

"Water being composed of hydrogen and oxygen;

"Sal-ammoniac being composed of

"1st. Hydrochloric acid containing chlorine and hydrogen;

"2nd. Ammonia, containing hydrogen, nitrogen, and oxygen;

"The water is decomposed under the galvanic action, and the oxygen fixes itself on the iron plate, forming an oxide of iron; the hydrochloric acid of the solution acting upon this oxide forms a hydrochlorate of iron, whilst the hydrogen precipitates itself upon the plate of the negative pole, and, unable to combine with it, comes up to the surface of the solution in bubbles.

"I would remark that it is important that a ferric solution should be employed which will not dissolve or corrode the plate intended to be coated, for if it be intended to use such a solution, though the iron will be precipitated, it will not only be in a non-coherent state, but the engraved surface itself will be liable to be attacked and injured. It may also be remarked that the coating of iron admits of being removed from a printing surface of copper without injury to the original plate, hence the original plate may, after being coated and used for some time, have the worn coating removed, and then be recovered with an iron coating as often as may be required."

Photo-Lithography.—Colonel James, of the Hydrographic Department of the Government, has introduced and used a process of photo-lithography, to which I cannot do more than allude. It is similar, in many respects, to the photo-lithographic and zincographic processes described by Mr. John Walter Osborne, in the *Photographic Society's Journal*, vol. 7, pages 163 and 213, as follows:—"In the first instance, a sheet of paper is prepared with albumen, in the usual way known to photographers; it is, when quite dry, passed through a copper-plate or lithographic press, upon a polished steel or copper plate, by which operation it receives a very smooth and regular surface; it is then coated on the same side with a solution of gelatine, to which an addition of bichromate of potash has been made; this is then carefully dried in the dark, and again passed through the press to ensure the finest surface. This operation completes the preparation of what I shall call the sensitive paper. Having made a negative of the original map bearing the desired proportions to it, I place a suitable piece of the sensitive paper just described under and in close contact with the map, and the whole is exposed to daylight in such a way that the luminous influence passing through the transparent parts of the negative, shall strike directly upon the prepared surface while the greater part of the paper is protected from its influence by the dark parts of the negative, which correspond to the white places on the original map. In the presence of the organic matter, the actinic agency effects the decomposition of the bichromate of potash, and the liberated nascent oxygen in all probability reacts upon the gelatine, altering its chemical characteristics in a peculiar manner. The visible effect, after removing the negative, is the formation of a picture in brown, upon the clear yellow of the paper, corresponding to the transparent portions of the negative, or to the black lines on the original drawings.

"This positive photographic print is next covered with an even coating of lithographic transfer ink, by passing it through the press, face downwards, upon an inked-in lithographic stone; the pressure causes the whole of the sensitive surface to lay hold of the ink, and bear away with it an even coating, hiding the brown photgraphic positive from view. The altered parts of the gelatine which have been exposed to the luminous action, appear to be possessed of a certain amount of affinity for the grease of the ink, so that they will be found to retain it with considerable tenacity.

"The next operation is to coagulate the albumen which still exists under the prepared surface; this is done by floating it upon boiling water, with the paper side downwards. A subsequent soaking for a short time causes the unaltered gelatine to swell in such a way as to raise the ink with it from the paper; and a slight amount of friction, with a sponge or other soft substance, removes the superflous ink from all parts of the inked print which correspond to the white parts upon the original document. When the lines appear clear and well defined, boiling water is poured over the whole, to remove the last traces of gelatine, and the print is dried. We are now possessed of a *bonâ fide* lithographic transfer, that is, a drawing, in greasy ink, of such a nature that it admits of being transferred to the stone in the ordinary manner, by simply inverting it thereon, and passing it through the press,—the albumen, which will be found to have withstood all the washing, acting as the adhesive substance under the ink to prevent the paper slipping on the stone.

"The whole of these operations need not occupy more than from two to three hours."

(*To be continued.*)

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A BIT OF EXPERIENCE.

BY M. S. ABBOTT.*

To all that have trouble with dirty plates and the collodion peeling off! I take my plates (if new) and scrape their edges, then there is no danger of getting our hands cut; they are now ready for solution, two pounds potash to four gallons of water. Put them in one by one; let them remain about six to ten hours, or even longer; it is immaterial if they are old varnished plates, all the same, it will come off like magic. On removing from the potash water, wash thoroughly with plenty of clean water. After this is done, and the plate still wet, I pour over the plate (in the same manner as I do collodion) a solution of albumen, one ounce (or one egg) to two ounces of water, beaten thoroughly and filtered through clean cotton. First wet the cotton in your hand before placing it in the funnel; let it fit lightly at the first, and after the liquid has run through once or twice, then remove the cotton and wash it thoroughly in clean running water, and again place it in your funnel and press it into the neck, not too tight, but so as it will filter close. Hang the coated plate upon two nails or stand upon a clean sheet of paper, always placing the albumen side towards the wall with the greatest possible care in regard to dust, smoke, and bad chemical fumes, until it is dry, then it may be packed away; if good care is taken with coated plates they will keep clean any length of time. You will not only have a good clean plate, but one that will work quicker than by the ordinary way of cleaning.

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* From the *American Journal of Photography*.

I have used the process for years, and find it the best and the cheapest, for one egg will cover twenty 8 by 10 plates, and two pounds of potash will last two months.

It only needs a trial, and then you may lay aside your vice, rouge, whiting, rotten stone, alcohol, canton flannel, and one man's labour,

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THE NEW METAL MAGNESIUM.

The *Daily Telegraph*, in an excellent article, says: "Magnesium, the last gift of this genuine goddess [Science] is like the others—like them in the quiet manner of the gift, and the timely discovery at last of what the gift could do for us. Who would have thought, while photographers were railing against fogs, and worshipping the sun in glass temples among the cats and chimney-pots, that the light they wanted was at their disposal all the while? No more than now we think that the methods of fixing the colours of nature by the camera, of aerial navigation, or of curing consumption, are within our reach, though Science laughs to herself at our 'No.' It is almost sixty years since Sir Humphrey Davy produced 'magnesium,' a bright white metal, brittle, light, then accounted curious only as being 'first cousin' in chemistry to such substances as Epsom salts, steatite, talc, and chrysolite. It is closely related to all the magnesian limestones; the meerschaum pipe is a silicate of its oxide, and abestos, which won't burn, belongs to the same stock. 'Nobody expected'—nobody but the *savans* ever 'expect'—that Davy's discovery could ever literally *enlighten* the world, and snuff the sun out, so far as photography goes? But Mr. Sonstadt, who looked up the forgotten metal, found methods to produce it in any quantity and of a perfectly pure quality. A wire thus manufactured was shown to give in flame a light which was not only sun-like in its brilliancy, but actually rivalled the solar beam in containing chemical or actinic rays. So rich is the magnesium lamp in those rays indeed, that the full power of the orb does not greatly exceed it. At the zenith distance of 67° the chemical brightness, of an unclouded sun is not more than five times that of a magnesium flame of the same apparent dimensions. This brilliant 'star' of science made its public *debut* at Bath, when Professor Roscoe exhibited two magnesium lamps. The room was flooded with a rich white illumination, in which the slightest hues of a lady's dress, or, more delicate test still, the faintest rose-colours on her cheek, were displayed as if by daylight. Sir Charles Lyell was photographed on the spot by the new sun, which thus 'rose' upon public attention. And besides its chemical uses in the beautiful art of photography, which it has made independent of our gloomy sky, the novel illuminator is a magnificent rival of the lime and magnetic lights. A thin wire is equivalent in power to seventy-four stearine candles; and to keep up that splendour for ten hours only two and a half ounces of magnesium need be consumed. True, one ounce of the metal is five times costlier than the same weight of silver; but the price is rapidly descending, as processes are perfected and demand increases. And the recently discovered material, which is already applied in lamps, gives off nothing unpleasant or vapourous in burning—no smell or evil gases, no inconvenient heat. At threepence the foot, sunlight of the softest character might be 'turned on' as readily as gas. That this will soon be the case is all the more likely because the Americans have heard of our new commodity, and send over for oils of sunshine. Their idea is that magnesium may serve them in the blockade; and it would be strange indeed to read that Davy's metal, suddenly flooding the seas with white brilliancy, had turned night into day for ships as well as photographic studios. Other Governments are also busy with magnesium, by means of their official *savans*, experimentalising upon its possible use in lighthouse lamps, and for signals at sea. For the last purpose it seems admirably qualified; it is but to take a few inches of the wire and a match, and in a moment a light may be shown over a vessel's side, which, thus naked, has been made out twenty-eight miles off. A little of the magnesium in powder gives to the 'bouquet' of rockets or similar fireworks, wonderful and piercing brilliance; and sensational dramatists and managers may henceforward illuminate 'situations' with a splendour unparalleled. By the magnesium lamp blues and greens, whites and yellows, might be matched at night. Here is a combination of qualities and promises which quite prepares us to learn that the wholesale manufacture of the metal has now been taken up by excellent hands. No doubt further benefits will spring from it, for nobody knows what uses the possession of cheap actinic force may not ultimately yield. And if such qualities were lurking in this out-of-the-way curiosity of the laboratory, what may not await us in other metals scarcely named at present—cæsium, titanium, iridium, osmium, rubium, and the rest? The *metals* only, do we say? The wide world lies open to its lords; the secrets of all things await us; the beach upon which Sir Isaac did but 'gather shells' stretches down before us, infinite as is the sand in the variety and beauty of its treasures—stretches down to the sea, the endless, boundless sea of Eternal Life, whence all the glories and the greatness, and the wisdom, and the works of the world we inhabit are, as it were, washed up from an exhaustless store of loveliness, order, and supremest perfection which it passes the sense to measure."

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 1*st March*, 1865.

The Grand Tremont Prize has been awarded, by the *Académie des Sciences*, to M. Poitevin, whose labours in photography are so well known. The committee express the choice of the *Académie* in the following terms:—

Upon the discovery of M. Daguerre being made known, M. Poitevin at once comprehended its great importance, and employed the few leisure moments which his duties as engineer in a manufacturing establishment allowed him, in seeking the means of reproducing the photographic picture by engraving or photolithography. An indefatigable enquirer, this skilful practical chemist submitted to the action of light such substances as he thought would be influenced by it, at the same time studying the nature of the reactions produced. In thus methodically attacking the subject, he ought to have succeeded, and he did succeed. The result of these researches became so absorbing to his mind, that in 1855 he resigned the lucrative post which for twelve years he had occupied in the manufactory, so as to be able to devote himself exclusively to the art to which he had given so great an impulse by his labours.

We describe briefly the principal results which recommend him to the favourable notice of the *Académie*. First, is a process for photographic engraving, which, in 1848, won for him a silver medal from the *Société d'Encouragement*, and then another process, termed *helioplastie*, employed in England, Germany, and France; he discovered about the same time the process of photolithography now in use.

Although many attempts had been made to transfer photographic pictures to stone, the processes employed were not familiar, and their application could not be considered practical. Starting from the remarkable reaction which a mixture of bichromate of potassa and an organic substance experiences under the influence of light, M. Poitevin found that the mixture, by virtue of this reaction, became insoluble, and then apt to retain the substances in powder added to it, and even the fatty ink with which it was covered. Turning this property to account, he succeeded in fixing printing ink in the parts influenced by light; from that time the solution of the problem of photo-lithography might be considered as accomplished for the arts and manufactures.

This important result constituted a new era in photography, as it permitted the rapid multiplying of proofs, and also rendered them unchangeable. We must however remark that if the proofs in stone leave something to be desired, the artist can retouch them, and cause defects to disappear; but the merit of the discovery belongs to the man of science. The principles upon which this process of photo-lithography are based have enabled M. Poitevin to fix upon various kinds of surfaces, such as paper, porcelain, &c., by means of substances sensitive to light, and rendered hygrometric after exposure to light—inert bodies in impalpable powder, such as carbon, metallic oxides, &c., hence *carbon printing* so called.

This last application obtained for M. Poitevin, in 1861, from the Paris Photographic Society, a prize founded by M. de Luynes for a process, by which permanent positive photographs could be obtained: and in 1862, he received "honourable mention" at the Universal Exhibition of London.

M. Poitevin has also availed himself of the principles and property, discovered by him, which the mixture of tartaric acid and perchloride of iron possess of becoming hygroscopic under the influence of light, to be fixed on the surface of plates enamelled with metallic oxides, in order to convert the photographic pictures into enamels; this transformation is made with very remarkable facility and exactness, and the results obtained are worthy of every attention. The whole of the labours of which we have rendered account must occupy a conspicuous and elevated place in the history of photography, for they have been the starting point of researches made during the past twelve years, with the view of substituting unchangeable bodies for the silver compounds which form photographic pictures, and for the compounds of gold with which they are usually covered to preserve them. We think also that these labours are destined to exercise a great influence upon the improvement of methods of operating now in use for the formation of *positive* proofs.

Such are the reasons which have influenced the committee to suggest to the *Académie* to award the Tremont prize to M. Poitevin for his photographic discoveries, and to allow him to enjoy it for two years, and also to aid him in continuing researches which have formed a real progress for science and art.

The *Académie* adopted the proposal of the committee.

COPYRIGHT IN ENGRAVINGS.

Mr. Editor,—My last two letters was written in reply to "J. S. W.'s" article in your Number for February 10. Since that, however, he has (in your last week's Number) finished his case. There is a little to be said upon that letter also: and I beg the favour of an extra occupation of your valuable space, for this time only. We shall then have each had his say, and, I shall cheerfully leave the question of our relative correctness to the decision of your readers; or, should *you* choose to sum up and give judgment, to you.

J. S. W.'s last letter is more creditable to him than its predecessor. Perhaps, all the vials of his wrath were there discharged; perhaps reflection has calmed his mind; perhaps —but we need not "perhaps" any more. The *fact* will do, that "J. S. W." has not again abused photographers and photography, and only fails upon the following points:—

In the paragraph marked I. (I cannot see the use of his I., II., III., IV.), he admits that publishers who have issued artist's proofs must accept the consequences I contended for, viz., loss of copyright. But, stating that publishers are most anxious about recent productions, on which they have fulfilled the law, he adds, "it is those prints which *the copyists* most desire to have;" and gives, as instance, a recent case of piracy of "The Derby Day"—demanding, too, why the name of the producer was not given up?

Those two words, "the copyists," are tell-tales; revealing (what has before been pointed out) that "J. S. W." considers all photographers of engravings to be alike. Because a man, unknown to and unrecognized by the trade, sells to a countryman a pirated picture, therefore, it is evidence of the general practice! If "J. S. W." were intimate with the trade he asperses, he would know that a pirate of "The Derby Day" must be a man free only of the streets, and without any name or address worth giving up: in fact, the case quoted proves it. The name was not given up, for (most likely) the best of reasons—no one knew it. A Birmingham stationer was discovered selling piracies, and punished by Mr. Gambart; if any one of equal position to that had produced the photograph, he would have been caught too. Because he was not, the inference is, he was a nobody. The moment he became somebody, he would be pounced on; and so must remain in hiding. What can such a man do? But "J. S. W." speaks as if *all* photographers of engravings were men "round the corner," instead of having Directoried names and addresses. The general body of "copyists," as he terms them, openly challenge all comers; they are no more chargeable with the odium of printing the "Derby Day," than Mr. Gambart is chargeable with the dishonesty of members of his class who manufacture false artist's proofs by covering over the publication line.

In paragraph III., "J. S. W." distinctly denies that *publishers* admit the right of an engraver to sell his presentation copies. Perhaps not; publishers refuse to admit many other things, patent enough to everybody else. But, whether they admit the right or no, engravers do sell their proofs, and maintain a right to do so.

I am twitted, also, with "omitting to state the opinion of the Vice-Chancellor, that *such proofs*, being so sold, would not vitiate copyright." But I contend, the Vice-Chancellor gave no such opinion. He said, "if an engraver struck off a number of *artist's proofs* after the plate was completed, but before the name and date were added, he would not acquire copyright;" "but where merely *working proofs* were taken, although the plate was complete, if they were not taken for the purpose of sale, but were accidentally sold," copyright would not be lost. —Here, the expression "artist's proofs" was used by His Honour to indicate the class of prints given to an engraver "as specimens of his art," (to quote "J. S. W.'s" own words) and whose issue, His Honour said, *did* vitiate copyright. The expression "*merely working proofs*," even of a complete plate, denotes a class of goods more worthy of the printing-room than presentation as fine copies. Are mere working proofs taken on india-paper, stamped with the seal of the Printsellers' Association, and autographed by the engraver, as presentation copies are? Would it be worthy the high position "J. S. W." justly claims for an artist-engraver, to receive, "as finished proofs and as specimens of his art," merely working proofs? Practice and common sense alike negative the idea. And, if publishers considered the copies given to engravers as being outside the Act requiring every impression to be lettered, why do they now affix the publication line to presentation copies? The fact is, that engraver's proofs are virtually artist's proofs, and, if unlettered, involve, as a consequence, the loss of copyright.

In paragraph IV., "J. S. W." thinks it very hard and unreasonable, that printsellers who refuse to adopt photography should have their property exposed "to be the prey of all who choose to copy it, and to run the chances of conviction under the present inefficient statutes." That they are *not* inefficient, he has just quoted a case to prove. And what would he have? Whose property is not exposed to those "who will run the chance of conviction" for stealing it? Should a printseller have better protection than a jeweller, a banker, or anyone else with property worth stealing? The police are open to all. Would "J. S. W." have a common criminal law for thieves in general, but an extra-severe law for the pirates of prints?

And what does he mean, what does he wish to imply, by this, in par. IV.:—"'Detector' *seeks to lessen* the value of precedents in the publishing trade, *or to point out remedies for any error*"? Seeks to lessen or to point out! That, certainly, is unanswerable.

Then, further on, it is necessary to skip *seventeen* lines of parenthesis, badly jumbled up, before we can complete an idea, begun on the tenth line from bottom, col. 1, p. 83, and buried till the eighth line of the next column. Omitting that parenthesis, and re-writing the sentence, we get this idea. "I quote the Acts of Parliament"—"to show what was evidently an evil" in the early days of engraving, and is much more so, now—viz., piracy. And "*putting aside all questions of whether* *the printsellers have done right or wrong*," I ask you, Mr. Editor, to co-operate with me in altering the present Copyright Acts.

Now "save me from my friends!" may you ejaculate, Mr. Editor. It is no longer possible to defend the printsellers, "J. S. W." implies, so we will shirk that point. They have got their trade into a muddle, through ignoring the Copyright Acts at first, and then invoking them. 'Tis not that they cannot write, but the copies are so bad!' Rub all out, and begin again. Above all, give "sharp, speedy, and inexpensive" means of enforcing penalties upon everybody who outrages anything in the shape of art, in whatever form it may be issued!

And then, very appropriately, "J. S. W." (or the printer for him) ends with a query, or note of interrogation (?) Well he may. Does it imply a doubt as to whether that fearful paragraph IV. will be understood? or, whether you, Mr. Editor, will hang back before his brilliant offer? For one, I must leave it, shrouded in that mystery which so frequently hangs over the case stated by "J. S. W.," and only apologizing for the space taken up in these valuable columns by an attempt to elucidate it in its proper phases.—Yours obediently. DETECTOR.

Photographic Notes and Queries.

ANILINE COLOURS FOR PHOTOGRAPHS.

SIR,—In reply to a note from Mr. Hele, which appeared in last week's number of the NEWS, I beg to say that the use of these colours is of material assistance to amateurs or to those who are not proficient in painting, as sizing or other preparation is not necessary, as in the use of the usual water colours. The aniline colours, when once applied, are absorbed by the albumen, which renders them impervious to light and air. The permanency of the albumen photograph is not in the least affected by using these colours. In answer to your correspondent's inquiries of what advantage or good is obtained by making the painted picture waterproof, I only wished to show that it can be done if required, the only benefit derived from rendering them waterproof is, if the photographs are used for show-cases, which are sometimes exhibited in damp places, or if photographs are wanted for sending abroad, a long sea voyage will not affect their colour. For my own part, I prefer highly glazing with the usual rolling machines after painting, which renders the colouring very nicely transparent, which cannot be done when water colours are used. In several places, Judson's dyes have been recommended for colouring photographs. I cannot obtain any result in using them equal to Dr. Jacobsen's pure aniline colours, prepared expressly for colouring photographs.

To introduce these very highly recommended colours in England, I have had an interview with Mr. Trübner, of 20, St. Dunstan's Hill, Great Tower Street, City, who wrote immediately to Dr. Jacobsen respecting the sale of these colours. The first importation of them shall be duly announced. I think I have answered all your correspondent's enquiries, but should any more questions arise I shall be most happy to answer them immediately.—I remain, sir, yours respectfully,

D. FRUWIRTH.

Talk in the Studio.

A NEW SOURCE OF IODINE.—The *Mechanics' Magazine*, speaking of new sources of several rare substances, says:—"Another interesting example is the discovery of a mineral source of that very valuable substance, iodine. The ocean is the great storehouse of this element, all seawater containing the iodides of sodium and magnesium, but only in such small relative quantity that to extract iodine directly from seawater is not practicable, and hence sea-weeds, which have the power of attracting it from the element in which they live and assimilating it into their own substance, have hitherto formed the sole commercial source of it. Chemists have been aware of its existence in certain Mexican silver ores, in various land plants growing near the sea, in sponges, and in the oil of the liver of various fishes; but none of these bodies, animal, vegetable, or mineral, contains it in such quantities as would pay for extraction. There is said, however, to have been lately discovered in Chili a mineral consisting of a mixture of iodide of lead with the oxide and chloride of that metal in such proportion as to contain ten per cent. of iodine. This mineral is believed to exist in considerable abundance, and if it really does so a great reduction in the commercial price of iodine must be a speedy result of its discovery. Such a result would be a great boon to the art of photography, and also to that of dyeing, since the brilliant dye recently discovered by Dr. Hoffmann, though the first, will doubtless not be the last, having this element among its constituents.

MAGNESIUM LIGHT AT THE PYRAMIDS.—Mr. Spiller calls our attention to a letter he has received from Professor Piazzi Smyth, stating that they have now got fairly to work in measuring the Pyramids. Speaking of the magnesium light he says:—"The magnesium wire light is something astounding in its power of illuminating difficult places. With any number of wax candles which we have yet taken into either the king's chamber or the grand gallery, the impression left on the mind is merely seeing the candles, and whatever is very close to them, so that you have small idea whether you are in a palace or a cottage; but burn a triple strand of magnesium wire, and in a moment you see the whole apartment and appreciate the grandeur of its size and the beauty of its proportions. This effect, so admirably complete, too, as it is, and perfect in its way, probably results from the extraordinary intensity of the light, apart from its useful photographic property, for, side by side with magnesium light, the wax candle flame looked not much brighter than the red granite of the walls of the room. There come parties—often many parties—of visitors to see the Pyramid every day without fail, and they come amply provided, too, with all sorts of means and appliances to enjoy the sight, *i. e.*, with everything but the needful magnesium wire; and one waistcoat-pocket full of that would be worth a whole donkey-load of what they do bring up to enable their souls to realize the ancient glories of the internal scene.

JAPANESE PHOTOGRAPHS.—We have been favoured by Mr. Edmund Brace, of Glasgow, with the sight of some very interesting photographs, consisting of portraits, taken in Japan by a native artist. They are of the orthodox card size and style, some being full length figures and others vignettes. A portrait of the artist himself, gives us a well marked intelligent face; and that of his wife, a pleasant amiable looking woman, sitting beside a table with a stereoscope on it, and a reading lamp much resembling one before us at this moment, of German construction. The best photograph in the series is a portrait of a pretty girl, with her "smoking apparatus, box containing pipe, spittoon, and charcoal fire." "Old hypo," has shed his detrimental influence on the pictures, they are unfortunately yellow and fading. Otherwise the photography is not bad; the prints are on very slightly albumenized paper.

THE DANGERS OF CYANIDE.—Mr. Blanchard calls our attention to a singular accident in the use of cyanide, from which very disastrous results were narrowly escaped. Some nitrate of silver solution having been spilled on the floor of the studio, a little cyanide was applied to remove it and prevent a stain. The following day the floor was washed by a domestic, who abraded her knuckle whilst at the work. Through this abrasion the trace of cyanide left on the floor was absorbed. In a very short time the hand became painful, the pain gradually extending up the arm, which began to swell frightfully, a dark livid mark appearing up the length of the arm. Advice being sought from a medical man, he at once said that some poison had been absorbed through the abrasion on the hand, and it was then remembered that contact with the cyanide had been possible. Prompt remedies were applied, which were happily successful, the dangerous consequences at first feared by the doctor gradually yielding to treatment.

PHOTOGRAPHS FROM ELECTRO-PLATES.—Our readers will remember an article in our last volume (p. 493), in which we described a new system of printing, in which half tone was secured in prints obtained by the printing press, and intaglio plates electrotyped from reliefs, produced by the action of light on gelatine and a bichromate. Mr. W. Woodbury has been pursuing his experiments in this direction with very great success, and has just forwarded us a couple of prints which illustrate the great progress he has made. There is perfect gradation of half tone, the image being slightly in relief, with a surface much resembling a fine piece of Limoges porcelain. The effect is exceedingly beautiful, and promises much more than we see.

AMATEUR PHOTOGRAPHIC ASSOCIATION.—A very successful soirée was held at the rooms of this association, in York Place, on the evening of Thursday, the 23rd. A very crowded gathering of the members and friends assembled at 8 o'clock, to examine (as far as the crush permitted) the large number of excellent specimens with which the walls were crowded. Good music and excellent refreshments added much to the enjoyment of the evening. At 6 o' clock the Prince of Wales visited the rooms, to examine the contributions of the members, to which he gave very discriminating attention during nearly an hour. He was received by the Council, prizeholders, officers, and other distinguished members of the Association. The affair was altogether a success, and reflected much credit on the management of Mr. Melhuish.

Female Employment in Colouring Photographs.—In a letter to the *Standard*, Madame Una Howard proposes that some systematic effort should be made to teach the art of colouring photographs to destitute ladies. She says: "the art of colouring photographs, to make them lifelike, is one that has already been attempted with great success, and is calculated to afford employment to many young ladies, who, being left in straitened circumstances, have yet, while their natural protectors were living and could afford it, received lessons in painting. Many hon. and right hon. ladies have kindly formed themselves into associations to promote the employment of those respectable, yet bereaved beings; and I would humbly suggest to such lady patronesses to promote the cultivation of this beautiful art by organising classes to acquire it as a source of livelihood. Having been myself engaged for several years in colouring for the most distinguished photographers of the United Kingdom, I shall be most happy to assist in organising such classes, and devoting all the time I can spare from my professional engagements to give such tuition as those lady patronesses might desire me to do, without encroaching upon their benevolent fund."

Portraits of Cardinal Wiseman.—We have received from Messrs. Moira & Haigh a portrait of his eminence the late Cardinal Wiseman, for which he sat some months before his death. It is a capital portrait of the frank open genial face, so unlike the ideal type of a Romish ecclesiastic or ascetic priest. The Cardinal is in what, we presume, may be called full dress; sitting in his archi-episcopal chair, which was taken to the studio for the purpose, with his own crucifix by his side; in the background is seen a view of his own church in Rome, painted for the purpose. Thus great completeness and keeping of sentiment are obtained in the picture. As a photograph, it is exceedingly soft, delicate, and brilliant; and as a picture, it is one of the most perfect we have seen produced by the camera. The disposition of light and shade, and the composition generally, are very fine indeed. The large picture, 10 by 8, is mounted on an India tint, and has the Cardinal's signature; the other is a card picture, and both are excellent.

The Pope.—It is said that the photographers of Rome are all busy in printing portraits of Pius IX., as the demands which have come from France and Germany since the publication of the Encyclical surpass all expectations.

Varied Applications of Photography.—Mr. H. Baden Pritchard sends a pretty little application of photography to the embellishment of a card containing ball-programme and engagements. He adds the following interesting remarks:—"Knowing your interest in all little novelties connected with photography, I send you herewith a little ball-programme for inspection. It is one constructed on an idea of my own. The photograph in the centre I proposed at first to emboss like the cameo portraits, but I found it looked better as it is. The expense of getting up a hundred of these is very trifling, as the photographs were taken with one of the diamond cameo camera's, which, of course, takes four pictures at a time, so one only need take 25 prints from the negative in order to get the hundred copies. The photograph is a view of Monte Rosa, and being nearly white and black, was very easy to execute. This is one of a hundred little purposes to which I think photography might easily be applied to great advantage."

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To Correspondents.

Stockwell.—The London Photographic Society meets at present in King's College, on the 2nd Tuesday of each month, from November to June. 2. Dissolve 1 grain of iodine, and 2 grains of iodide of potassium in 1 ounce of water, after washing off the iron apply this for about a minute, then wash off and apply the intensifier.

A Poor Amateur.—The patentees of the Wothlytype process have given the right to practise it to amateurs without charge. No licence is required unless the process be practised for profit.

Frank D.—Articles on the use of chloride of silver in collodion have appeared on pp. 517 and 553 of our last volume, and on pp. 25 and 29 of the present volume.

Engineer.—There have been two patents recently taken for printing processes, in which a map, plan, or engraving may be copied without taking a negative. The principle upon which they are based is common property, and if, by experiment, you find any mode of applying that principle other than those which are patented, you are quite at liberty to use such mode. The process is published in our last volume and in our Year-Book.

A Subscriber.—If the Daguerreotype in question were taken after the process of gilding was introduced, it is not probable that it is faded. It may have become tarnished and discoloured, and this may be removed by the use of a solution of cyanide. The operation is, however, a delicate one, and should not be attemtped, if you value the picture, by a novice. An old Daguerreotypist is the proper person. If you are anxious to try it yourself, then dissolve 20 grains of cyanide in an ounce of water, and having wetted the surface of the plate, observing carefully that the water flows without running in greasy streaks, pour the cyanide solution over it, keeping it moving until the stains disappear; then wash thoroughly and rinse with distilled water. The drying will then need care: take the plate by one corner with a pair of pliers, and hold it over the flame of a spirit-lamp, which must be kept in motion, and the plate held so that it drains as well as dries. It should dry from the top, and removal of the moisture may be assisted by gentle blowing.

W. S. Bradshaw.—The cause of the veiled image is an unsuitable collodion. Your collodion dries opalescent, instead of transparent. Before adding the sensitive salts to the collodion, pour a little of the latter on a glass plate: if it dry clear and transparent it is fit for the purpose; but if it dry opalescent or opaque it is unsuitable.

Lens for Enlarging.—Mr. Burgess, of Norwich, whose enlarging camera was described in our last volume, writes as follows:—"You informed "A. B." last week that I use a quarter-plate lens in my enlarging camera; it is a Dallmeyer's No. 1 B long focus."

F. L. P.—The chief peculiarity in Mr. Mudd's use of the collodio-albumen process, consists in his employment of a solution of pyrogallic acid without silver, or acetic acid to bring out the image, and then intensifying as may be necessary afterwards.

G. M.—The critic in our contemporary was in error. There is no dodging or sunning down in the "Welsh Girl" and "Sunshine," exhibited by Mr. Robinson in Scotland. They are genuine effects produced by genuine means, and all that is in the prints is in the negatives. We do not agree with you, however, as to the use of sunning down, &c., being illegitimate. Whatever artifice will really improve the picture is, in our estimation legitimate; we care more about the end than the means.

P. T.—Slow development is more conducive to intensity than quick development, and, other things being equal, a weak developer will therefore answer your purpose best.

Water-tight Tops for Baths.—J. F. N. writes on this subject to call attention to the importance of employing the best unvulcanized sheet of india-rubber for the purpose. He says:—"Vulcanized india-rubber will not do, but the best unvulcanized or cut sheet india-rubber is the best thing you can use. There is no India-rubber so common as common vulcanized. Then, again, as regards gutta-percha for photographic work, the best thing you can do as regards that, is to inform photographers that they should avoid it. In the first place, you cannot get it pure; and second, it soon gets hard and brittle, and will snap like glass. In mixing gutta-percha, red lead is often added, to make the brown colour, and white lead, which costs 3d. per lb., to make it heavy, by which the adulterators make 1s. 9d. per lb. by the white lead." As a general rule, we do not recommend gutta-percha, because of the dangers attending it; but it is possible, though difficult, to get it pure. We have ourselves used it for years with perfect impunity; but we have known many evils from the use of adulterated samples.

D. M.—It is probable that the flatness of which you complain in all your pictures arises from the presence of actinic light in your dark room; the print enclosed is very suggestive of this defect.

B. L.—You can obtain portraits with a landscape lens; but the exposure will be longer than with a portrait lens. 2. About eight inches equivalent focus will give you good results.

T. R. S.—You have too much top and front light; you can only obtain hard, flat, inartistic pictures with such a light.

B. P.—Add a few drops of tincture of iodine to your new and colourless collodion; it will cause it to give clearer shadows without making it appreciably slower.

F. R.—Registering your copy of a print will not protect you against any one else copying the same print. 2. You may copy an engraving of fifty years old without fear.

A Young Photographer will find in a letter in the present number the reason for desiring tints to be waterproof. The work our correspondent mentions, "Newman's Harmonious Colouring," is very excellent.

The Pantascopic Camera.—Mr. P. Le Neve Foster's reply to Mr. Johnson will appear in our next.

M. McIntyre.—The best lens we know for architectural work is the triple, and it is excellent for landscapes besides. It will, therefore, suit your purpose best.

G. R. B.—Where some portion of a negative, the sky for instance, must be masked out for some purpose, a piece of blackened photographic paper placed in contact will answer best. We don't like the practice where it can be avoided; if it be absolutely necessary, use paper and pare the edge thin, so as to avoid a hard line where it joins the image.

Sol the Younger.—We hear Hollingsworth's paper generally highly spoken of for enlargements. We believe Mr. Sanford has given especial attention to paper for enlargements, and can possibly supply you.

"The Wothlytype Specification in France;" "India-rubber, Gutta-percha, &c., in Connection with Photography;" "The Past and Present of Photography," and several other important articles in type are compelled to stand over for want of space.

Several Correspondents in our next.

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All Communications for the Editor to be addressed to 32, Paternoster Row.

THE PHOTOGRAPHIC NEWS.

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THE USE OF INDIA-RUBBER AND GUTTA-PERCHA IN PHOTOGRAPHY.

At the last meeting of the Chemical Society, Mr. Spiller read an interesting paper on the *Oxidation of India-rubber*, which is suggestive of some conclusions important to photographers. It has been well known to persons intimate with the uses of both india-rubber and gutta-percha, that these substances deteriorate by age and exposure to the atmosphere, and it has been believed that this deterioration was materially aided, if the action of light were added to that of the atmosphere. Gutta-percha especially was known to become brittle and rotten, "perished" as we have heard it technically phrased. India-rubber, although in less degree, was known to be subject to a similar change. The researches of Mr. Spiller as to the nature of this change are very interesting. Having occasion to examine some "patent waterproof felt,"—a fabric of cotton wool made waterproof with a solution of india-rubber, which had been laid aside for six years, he found that it no longer possessed the same qualities it did before, it was looser in texture and no longer waterproof. A sample of the freshly prepared felt gave on treatment with benzole a solution of india-rubber, which on evaporation left a continuous elastic film: but the old felt when treated with benzole, left on evaporation a brownish resinous substance something like shellac. A sample of this product now before us, with which Mr. Spiller has favoured us (together with examples of the felt old and new), is a little darker than shellac, and much more friable. It may be interesting to give Mr. Spiller's remarks at length, as officially reported in the *Chemical News*. Speaking of the "Patent Waterproof Felt," he says:—

> This material serves the purpose of a cheap packing, and is used in the exportation of silk and other valuable fabrics, stationery goods, and many articles which are liable to be affected by damp; it is sold in sheets of great length and about a yard wide, and appears to be made by cementing or matting together the fibres of cotton wool through the intervention of india-rubber paste or solution, so that after the evaporation of the coal-naphtha or other solvent, and passing through rollers, a continuous and water-repellant fabric is produced. About six years ago, Mr. Spiller purchased some of the waterproof felt, and made some useful applications of it in the way of photography; some of the material had, however, been laid aside until recently, when, upon examination, it proved to possess no longer the strength, close structure, and waterproof qualities of the original article. Finding this to be the case, the properties of the aged material were compared with a sample of recent manufacture, and the altered fabric examined in the same manner that it had been tested six years ago—viz., by extracting the rubber with benzole, and noting the character of the film left upon the evaporation of the solvent. When thus treated the original fabric furnished a beautifully white cotton flock, and a solution which, being evaporated, left a perfectly elastic film of pure india-rubber; and the same results were obtained upon the examination of the newly manufactured sample; but, on the other hand, the altered fabric, when treated with warm benzole, gave a discoloured cotton and a solution which left upon evaporation a resin, or brownish-yellow brittle substance closely resembling shellac. The chief examination of this interesting product was made upon the material extracted from the fabric by warm alcohol, which left insoluble, besides the cotton, a small quantity of unchanged rubber easily separated by filtration; and the amount of the brittle resin procured in this manner from a square foot of the fabric weighed, after complete evaporation of the solvent over a water bath, 74 grains. A considerable quantity of this altered india-rubber was thus prepared, and its chief properties were the following:—It is freely soluble in alcohol, especially if warmed, in wood spirit, chloroform, and in benzole as already stated. It is not appreciably soluble in ether, bisulphide of carbon, or oil of turpentine. Alkalies dissolve it with ease, and it may be reprecipitated from such solutions by neutralising with acids. Like india-rubber itself, it becomes bleached upon immersion in aqueous ammonia. The resin fuses below the temperature of boiling water, and when strongly heated in a retort gives off an amber-coloured oil of agreeable empyreumatic odour, besides furnishing water,—a proof of its containing oxygen. At ordinary temperatures it is extremely brittle and highly electric, so much that it cannot be powdered in an open mortar without loss. When rubbed with silk the substance exhibits the phenomena of "resinous electricity." An analysis of the resin was made by combustion with oxide of copper, which indicated the following percentages:—
>
> | | |
> |---|---|
> | Carbon ... ... | 64·00* |
> | Hydrogen ... ... | 8·46 |
> | Oxygen ... ... | 27·54 |
>
> For the reasons adduced by Dr. Hoffmann in the case of the altered gutta-percha examined by him, Mr. Spiller abstained from constructing a formula, merely regarding this substance as an oxidation product formed directly from caoutchouc by the absorption of atmospheric oxygen in much the same manner that resins are formed from essential oils and other hydrocarbons.

With a knowledge that the decomposition or change here described is certainly, although slowly going on the india-rubber and gutta-percha, in use for various photographic purposes, it becomes an important consideration as to how far it will exercise a detrimental influence. The thinner the layer, as in the felt in question, the more readily the change will doubtless take place; but it will not the less be in progress when the material is in greater bulk. Where it is used in the thin layers necessary in preparing photographic paper, it will most readily be acted upon, and as Mr. Spiller observes in his communication to us on the subject,—"Mr. Sutton's india-rubber paper will be changed into Mr. Cooper's resinized paper." Fortunately, we have no detrimental result to anticipate from such a change, unless there be, as in the case of the felt, some discolouration in the process of change. This, however, in the attenuated layer presents, if observable at all, would only give a delicate

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* In writing these numbers upon the board Mr. Spiller placed in comparison with them the figures representing one of Dr. Hoffmann's compounds from gutta-percha, viz.:—

Carbon	62·79
Hydrogen	9·29
Oxygen	27·92

india-tint to the paper. In the case of gutta-percha baths, and wooden baths lined with india-rubber, and various other vessels in which these materials are used, the change may produce a brittle condition, and consequent leakage, as one of the least, because most readily detected evils. As to how far the surface may acquire a condition which will act on the nitrate of silver solution, we are uncertain. We remember some years ago using a gutta-percha bath for four or five years, the silver solution remaining constantly in it during that time. We never experienced the least trouble with the bath, which was at all traceable to the gutta-percha, until the end of the time we have mentioned, when fog became common on the plates. The bath on being rectified worked well for a few plates, and when it had been in the gutta-percha vessel for about an hour, again fogged. The same solution on being corrected, and placed in a porcelain vessel, continued to work well. The gutta-percha vessel, being left empty, was examined at the end of a few days; on drying it had collapsed and warped, and was rotten and brittle, breaking and crumbling like a piece of half-baked earthenware. A slow deterioration had evidently been taking place, which produced no bad effects at first, but suddenly reached a stage at which it became incurably injurious. Mr. Spiller's interesting communication will at once call the attention of photographers to the various vessels of these materials they may have in use, and also to its possible bearing upon any other applications of gutta-percha or india-rubber to photography.

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DR. VOGEL'S METHOD OF TESTING SILVER SOLUTIONS.

We always approach anything connected with the polemics of photography with reluctance, the more so if the dispute arise as much out of the spirit of rival journalism as regard for scientific truth. But there are occasions when these subjects cannot be avoided. We have a contemporary, who appears to be in a state of chronic irritability, constantly in trouble, ever ready to construe the most innocent remarks into personality, and fancy offence where no one else would have dreamed of such a thing. We are not disposed to regard for with much harshness the faults which may arise either from natural infirmity of temper, or inexperience in scientific dialectics, and therefore generally let these ebullitions pass without notice; but as one of them occurred last week in which not only ourselves, but an esteemed confrere and contributor, who may be less familiar with the amenities of our contemporary than we are, is concerned, we feel it necessary to refer to the matter.

The circumstances are these: In a recent number of the *Photographische Mittheilungen*, an article appeared by Dr. Vogel, which had been read at a meeting of the Berlin Photographic Society, in which he described a new and ingenious method of testing silver solutions. On subsequent experiment he found that he had deduced conclusions too hastily, and attributed results to one agent which belonged to another. In sending this article for our pages (see p. 89) he had an opportunity of correcting the error, and modifying the process so as to render results certain instead of doubtful, which they might have been if the method were practised as first described. It so happened that an English contemporary had translated the article and published it as it originally stood, and Dr. Vogel with the zeal for truth which distinguishes the true votary of science, requested us to call especial attention to the modification as it appeared in the article he sent for our pages. He did not hesitate to avow his own error, arising from hasty conclusions, when scientific truth was at stake. In his letter to us he called our attention to the fact that our contemporary having translated the article as it originally stood, it was important that we should call especial attention to the correction he sent us, to stay the progress of error. In doing this it was necessary that we should explain the source of the error by pointing out that the article in our contemporary was a translation from the *Mittheilungen*, as no recognition of that authority was made. This we did in the simplest and briefest terms, never even mentioning our contemporary by name, and neither making accusation nor comment. The simple fact that we made the correction is, however, a grave offence, something in the character of leze-majesty, in the view of our contemporary, who forthwith proceeds to denounce "unprovoked inuendoes" and vapour about his journalistic honesty. Does our contemporary remember the French proverb "*qui s'excuse s'accuse?*" We made no charge against his honesty, and we leave it to others to decide why he defends it. But this is not all, having published, in our explanation of the matter, an extract from Dr. Vogel's letter, in which he makes the necessary correction, our contemporary first affects to doubt that this letter came from Dr. Vogel, he says it "purports" to be such a letter, and next affirms his conviction that it was never intended for publication, and only finds its way into print through an "injudicious friend." Of course all this is very unimportant to anyone but the writer of the article; and we should not, so far as this is concerned, have referred to the matter, had the said writer not proceeded to "darken counsel by the multitude of words without wisdom," and attempt elaborately to prove that the method, as it appeared in his pages, contained no error, and that Dr. Vogel himself is wrong in stating that he was originally in error. This too, might, so far as we are concerned, have passed for what it was worth, had it not been, as we have before said, that an esteemed *collaborateur* is concerned in the matter, and to his pen we leave it in a very few words to explain the fallacy which exists in our contemporary's elaborate attempt to prove the truth of an error. "A little knowledge is a dangerous thing," especially if it be unaccompanied by modesty, and a consciousness that the knowledge is limited. Dr. Vogel writes again his explanation of his position, thus:—

"The Editor of the *British Journal* states it to be an error on your part and mine that 'peroxide salts of iron, free from NO_5, do not produce the effect' necessary in my process; and believes that I have 'written this note hastily and without a due consideration of chemical facts, which have been well ascertained.'

$$Fe_2\,O_3\,3SO_3 + 3KI = 2Fe\,I + 3KO\,SO_3 + I$$

In answer to this objection, allow me to remark:—

"It is true that persulphate of iron, free from NO_5, liberates the iodine from a solution of iodide of potassium. I have known this action for a long time, and for this reason I have employed at first the persulphate of iron in my process. But I have found in further experiments that this action is not instantaneous (which is necessary in my process) but very slow (or heavy). Mix solutions of persulphate of iron, free from NO_3, with starch: on the other hand, mix nitric acid containing NO_3 with the same matter, put at the same time in the two solutions one drop of solution of iodide of potassium 1 to 100, and you will find that the blue colour appears in the solution containing NO_3 instantaneously, but in the persulphate of iron solution free from NO_3 the blue colour appears only after five or ten minutes.

"For this reason pure peroxide of iron is useless in my process, and I repeat, which I have said in my last letter to you and I now repeat: 'That it is not the iron salt which produces the effect of liberating the iodine from its combination with potassium. Peroxide salts of iron, free from NO_3, do not produce the effect.' Herm. Vogel."

Our friend, Dr. Vogel, confines himself to the simple exposition of the chemical error, and begs us not, so far as he is concerned, to permit prolonged dispute. He leaves any additional remark, if necessary, to us, simply adding as indicating his estimate of the value of the cobwebs of flimsy cobwebs, the following apt quotation from Goethe's *Faust*:—

> "Grau, treuer freund ist alle theorie
> Und grün des lebens goldner baum."*

We have not the slightest disposition to enter into prolonged controversy, and simply content ourselves with recommending our contemporary to be sure he is attacked in future before he assumes an attitude of defence. When Don Quixote charged the windmills his energy resulted in an ignoble spill.

THE "WOTHLYTYPE" SPECIFICATION IN FRANCE.

M. Wothly has secured his uranium printing process in France, and the details of his specification are open to all who are prepared to disburse twenty-five francs at the bureau of the "minister" in charge of the patent department. The specification is a much more elaborate document than that of the English patentees, but it differs rather in entering into tolerably minute detail than in any diversity in the process. The English patentees contented themselves with broadly stating the process they desired to protect, with sufficient precision to enable a photographer to produce pictures by it, without confining themselves to formulæ which circumstances might render it desirable to alter. We think they did wisely, as experience has already suggested many modifications in detail, rendered necessary by varying conditions of temperature and different classes of negatives. The French specification possesses more of the character of a precisely stated process, not admitting of much deviation, and we are not surprised that some of our French contemporaries came to the conclusion that details were suppressed in this country when the specification was first published. On this subject we may here remark that in a letter received a few days ago, referring to the specification from our esteemed confrere, M. Ernest Lacan, he says, that in the remarks we quoted from *Le Moniteur* two or three months ago, he did not intend to imply that M. Wothly had held back any part of the process from the English patentees, or that they were misleading photographers, but he simply expressed a conviction that the English journals only published certain extracts from the specification, the full details being reserved for the licencees. We, however, published the full specifications filed at the patent office, no detailed manipulatory instructions, doubtless for prudential reasons, being given.

The details given in the French specification are for the most part very similar to those communicated to us by Col. Stuart Wortley, and which, with modifications to suit circumstances, are practised at the printing establishment of the Association.

In the instructions for preparing the sensitive salts we find an explanation of the allusion in the French journals to "triple salts" which gave a colour to the idea of suppression somewhere. Herr Wothly, it appears, precipitates the oxide of uranium by dissolving the nitrate in water, and adding ammonia. A complex body is thus obtained, consisting, probably, of the uranate of ammonia; this is insoluble in water, and after being washed and dried, it is dissolved in nitric acid, and subsequently crystallized. Of this double nitrate of uranium and ammonia a saturated solution is made by dissolving twenty-four parts in twelve parts of water, and to this one part of nitrate of silver, dissolved in two parts of water is added. This mixture is then crystallized to form the so-called "triple salts." It will be seen that whilst this preparation explains the allusion, the various bodies are not added in their combining proportions, and that they form rather a mixture than a chemical combination. Of this "triple salt" three parts are dissolved in eight parts of alcohol, to which are added a quarter of a part of water and a few drops of nitric acid. To six parts of plain collodion from two to three parts of this sensitizing solution are added, according to the kind of negative; also a few drops of nitric acid, which are said to increase sensitiveness.

It will be seen from this that Herr Wothly preserves an invariable proportion between the nitrate of silver and the nitrate of uranium. In our own experience it has been found desirable to vary the proportion of nitrate of silver according to the character of the negative, the temperature, and the quality of results desired. We believe Colonel Stuart Wortley has found a similar necessity. The precipitation of the uranium by means of ammonia is doubtless desirable, especially with the impure commercial samples of nitrate of uranium. It will be remembered that Mr. H. Cooper adopted a course somewhat similar some months ago. But it appears to be taking unnecessary trouble, without any advantage that we see, to crystallize the nitrate of silver with the uranium salt. It is a much simpler plan to keep a standard alcoholic solution of nitrate of silver ready which can be added in any proportion that circumstances render desirable at any moment. The maximum proportion of nitrate of silver employed in the formula as given by Herr Wothly is less than three grains to an ounce of collodion, and the minimum rather less than two grains. We have obtained very good results with two grains, but more vigour is secured with four grains of nitrate of silver to each ounce of uranized collodion.

Herr Wothly also gives a formula for preparing the uranized collodion with a salt of palladium, platinum, or gold in place of the salt of silver.

In regard to the preparation of the collodion Herr Wothly's instructions are deficient. Nothing, whatever, is said of the quality of the pyroxyline, nor of the method of preparing it. This is, nevertheless, one of the most important points in the preparation of collodion for printing purposes. A horny sample is apt to blister and leave the paper, and also to split and reticulate very readily on the addition of any trace of water, whilst a powdery sample, although adhering well, gives little surface, and afterwards dries slightly opalescent. If the employment of collodion in printing become general the preparation of pyroxyline of the most suitable quality will require attention and careful experiment. Herr Wothly speaks of pyroxyline (coton poudre), as an absolute thing, not varying in quality; he employs it at the rate of about ten grains to the ounce of solvents, which consist of two parts of ether, and one part of alcohol. To this is added about a minim of the "harz oël," to which allusion has before been made. This "harz oël" consists of equal parts of castor oil and Canada balsam dissolved in ether. It has been supposed by some that the object of this addition was to form an organic compound with the sensitive salts. We believe, however, that its only purpose is to secure better adherence of the collodion film to the paper, and so prevent blisters, &c. In some cases it will be found desirable, but with many samples of collodion it is not needed. If any oleaginous body be added to collodion in excess it tends to make it repel aqueous solutions, and interfere with toning, fixing, &c. From our own experiments, and those of some of our correspondents, we are disposed to believe that a small portion of sugar might with advantage be made to replace the "harz oël."

In preparing the paper, Herr Wothly, in this specification recommends the starch of potatoes, arrowroot, wheat, or lichens; to half an ounce of starch, and a few grains of acetate of lead, in about a pint of water warmed to about 100°, about two ounces of albumen are added, and the paper is either sponged with this or floated on it. He also describes a method of preparing albumenized paper suitable for his process, which is excited by floating on a bath of the salts above described dissolved in water, ether, and alcohol, with the addition of a little nitric acid. The starch prepared papers may be floated on this bath for plain prints. Both these methods are old, and cannot properly be included in the patent.

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* "All theory, my friend, is grey;
But green is life's bright golden tree."
Filmore's Translation.

After exposure the prints are to be immersed in a bath consisting of acetic acid and hydrochloric acid, each one part, in water about sixty parts, to remove the uranic salt, which will be effected in about ten minutes. After rinsing, the prints are ready for toning, which can be done in any of the ordinary toning baths of gold or platinum. Herr Wothly prefers a bath of hyposulphite of lime, one part in eight, with chloride of gold at the rate of about three grains to each ounce of the hyposulphite; instead of the hyposulphite of lime, the hyposulphite of soda, magnesium, &c., or the sulphocyanides may be used, using the same proportions of gold and water.

The necessity of fixing is, in the specification, distinctly admitted: this is the chief distinction of importance between it and the English specification. Many of the points of detail had already been worked out in this country and coincide in many respects with the experiences of Herr Wothly. If the process be destined to become general it will doubtless receive much modification and improvement, as every other photographic process has done, from the united efforts of many experimentalists, and whilst the publication of detail in a specification is useful in a suggestive sense, we think it is wiser to confine such a document to a general statement of the principles and modus operandi, leaving open those details which may be varied by every operator without materially vitiating results, and which may be materially amplified and improved by independent persons, as indeed in this case is illustrated by the labours in this direction of Mr. H. Cooper.

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PICTURES OF NIAGARA.

Taken with Camera, Pen, and Pencil.

by J. WERGE.*

I shall now endeavour to describe our next trip, which was to the Canadian side – how we got there, what we did, and what were the impressions produced while contemplating those wonderful works of nature. In the first place, to describe how we descended to the "ferry" and crossed the river. On the north side of the American Fall a railway has been constructed by an enterprising American, where the "cars" are let down a steep decline, by means of water-power, the proprietor of the railway having utilized the very smallest amount of the immense force so near at hand. Placing our "traps" in the car, and seating ourselves therein, the lever was moved by the "operator,' and away we went down the decline as if we were going plump into the river below; but at the proper time the water was turned off, and we were brought to a standstill close by the boat waiting to ferry us across. Shifting our traps and selves into the boat and sitting down, the ferryman bent to the oars and off we dashed into the dancing and foaming waters, keeping her head well to the stream, and drawing slowly up until we came right abreast of the American Fall, then letting her drop gently down the stream, still keeping her head to the current, we gained the Canadian shore: our course on the river describing the figure of a cone, the apex towards the "Horse Shoe." Ascending the banks by a rather uphill road, we reached the Clifton Hotel, where we took some refreshments, and then commenced our labours of photographing the Grand Rapids and the Falls, from Table Rock, or what remained of it. On arriving at the spot, we set down our traps and looked about bewildered for the best point. To attempt to describe the scene now before us would be next to folly, nor could the camera, from the limited angle of our lens, possibly convey an adequate idea of the grandeur and terrific beauty of the Grand Rapids, as you see them rushing and foaming, white with rage, for about two and a half miles before they make their final plunge over the precipice. Many years ago an Indian was seen standing up in his canoe in the midst of these fearful rapids. Nearing the brink of the terrible Fall, and looking about him he saw that all hope was lost, for he had passed Gull Island, his only chance of respite: waving his hand, he was seen to lie down in the bottom of his canoe, which shot like an arrow into the wild waters below, and he was lost for ever. Neither he nor his canoe was ever seen again. In 1829 the ship Detroit, loaded with a live buffallo, bear, deer, fox, &c., was sent over the falls. She was almost dashed to pieces in the rapids, but many persons saw the remains of the ship rolled over into the abyss of waters. No one knew what became of the animals on board. And in 1839, during the Canadian Rebellion, the steamer Caroline was set fire to in the night and cast adrift. She was drawn into the rapids, but struck on Gulf Island, and was much shattered by the collision. The bulk of the burning mass was swept over the falls, but few witnessed the sight. Doubtless no fire on board a ship was ever extinguished so suddenly. The view from Table Rock is too extensive to be rendered on one plate by an ordinary camera. But the pantascopic camera would give the very best view that could possibly be obtained.

Taking Table Rock as the centre, the entire sweep of the Falls is about 180 degrees, and stretching from point to point for nearly three quarters of a mile,—from the north side of the American Fall to the termination of the Horse Shoe Fall on the west side. The American and Centre Falls present a nearly straight line running almost due north and south, while the Great Horse Shoe Fall presents a line or figure resembling a sickle laid down with the left hand, the convex part of the bow lying direct south, the handle lying due east and west, with the point or termination to the west. The waters of the two American Falls rushing from east to west, and the waters of the Canadian Fall bounding towards the north. By this description it will be seen that but for the intervention of Goat and Luna Islands, the three sheets of water would embrace each other like mighty giants locked in a death struggle, before they fell into the lower river. The whole aspect of the Falls from Table Rock is panoramic. Turning to the left, you see the American rapids rushing down furiously under the bridge, between Bath Island and the American shore, with a force and velocity apparently great enough to sweep away the bridge, and four small islands lying a little above the brink, and pitch them all down on to the rocks below. Turning slowly to the right, you see the Centre Fall leaping madly down between Luna and Goat Islands, covering the Cave of the Winds from view. A little more to the right, the rocky and precipitous face of Goat or Iris Island, with the "Biddle Stairs" like a perpendicular line running down the precipice; and to the extreme right the immense sweeps of the Great Horse Shoe.

Doubtless this fall took its name from its former resemblance to the shape of a horse shoe. It is, however, nothing like that now, but is exactly the figure of a sickle as previously described. Looking far up the river you observe the waters becoming broken and white, and so they continue to foam and rush and leap with increasing impetuosity, rushing madly past the "Three Sisters"—three islands on the left; and "Gull Island" in the middle of the rapids, on which it is supposed no man has ever trodden, until, with a roar of everlasting thunder, which shakes the earth, they fall headlong into the vortex beneath. At the foot of this Fall, and for a considerable distance beyond, the river is as white as the eternal snows, and as troubled as an angry sea. Indeed, I never but once saw the Atlantic in such a state, and that was in a storm in which we had to "lay to" for four days, in the Gulf Stream.

The colours and beauty of Niagara in sunlight are indescribable. You may convey *some* idea of its form, power, and majesty, by describing lines and giving figures of quantity and proportion, but to give the faintest impression of its beauty and colours is almost hopeless. The rich lovely green on the very brink of the Horse Shoe Fall is beyond conception. All the emeralds in the world, clustered together and bathed in sunlight would fall far short of the beauty and brilliancy of that pure and dazzling colour. It can only be compared to an immense unknown brilliant of the emerald hue, in a stupendous setting of the purest frosted, yet sparkling silver. Here too is to be seen the marvellous beauty of the prismatic colour, almost daily. Here you might think the "Covenant" had been made, and set up to shine for ever and ever at the Throne of the Most Mighty, and here only can be seen the complete *circle* of the colours of the rainbow. I saw this but once, when on board the *Maid of the Mist*, and almost within the great vortex at the foot of the Falls. A brilliant sun shining through the spray all around, placed us in a moment as it were in the very centre of that beautiful circle of colour, which, with the thunder of the cataract, and the sublimity of the scene, made the soul feel as if it were in the presence of the "Great Spirit," and this the sign and seal of an eternal compact. Here, also is to be seen the softer, but not the less beautiful Lunar Rainbow. Whenever the moon is high enough in the heavens, the lunar bow can be seen, not fitful as elsewhere, but constant and beautiful as long as the moon is shedding her soft light upon the spray. On one occasion I saw two lunar bows at once, one on the spray from the American Fall, and the other on the spray of the great Horse Shoe Fall. This I believe is not usual, but an eddy of the wind brought the two clouds of spray under the moon's rays. Yet these are not all the "beauties of the mist," one morning at sunrise, I saw one of the most beautiful forms the spray could possibly assume. The night had been unusually calm, the morning was as still as it could be, and the mist from the Horse Shoe had risen in a straight column to a height of at least 300 feet, and then spread out into a mass of huge rolling clouds, immediately above the cataracts. The rising sun shed a red lustre on the under edges of the cloud, which was truly wonderful. It more resembled one huge solitary column supporting a canopy of silvery grey cloud, the edges of which were like burnished copper, and highly suggestive of the Temple of the Most High, where man must bow down and worship the great Creator of all these wondrous works. It is not in a passing glance at Niagara that all its marvellous beauties can be seen. You must stay there long enough to see it in all its aspects—in sunshine and in moonlight, in daylight and in darkness, in storm and in calm. No picture of language can possibly convey a just conception of the grandeur and vastness of these mighty cataracts. No poem has ever suggested a shadow of their majesty and sublimity. No painting has ever excited in the mind, of one that has not seen those marvellous works of God, the faintest idea of their dazzling beauties. Descriptive writers, both in prose and verse, have failed to depict the glories of this "Sovereign of the World of Floods." Painters have essayed with their most gorgeous colours, but have fallen far short of the intense beauty, transparency, and purity of the water, and the wonderful radiance and brilliancy of the "Rainbow in the Mist." And I fear the beauties of Niagara in natural colours can never be obtained in the camera; but what a glorious triumph for photography if they were. Mr. Church's picture, painted a few years ago, is the most faithful exponent of nature's gorgeous colouring of Niagara that has yet been produced. Indeed, the brilliant and harmonious colouring of this grand picture can scarcely be surpassed by the hand and skill of man.

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* Continued from p. 102.

After obtaining our views of the Grand Rapids and the Falls, from Table Rock, we put up our traps, and leaving them in charge of the courteous proprietor of the Museum, we prepared to go *under* the great Horse Shoe Fall. Clothing ourselves in an india-rubber suit, furnished by our guide, we descended the stairs near Table Rock, 87 steps, and led by a negro, we went under the great sheet of water as far as we could go to Termination Rock, and standing there for a while in that vast cave of watery darkness, holding on to the negro's hand, we felt lost in wonder and amazement, but not fear. How long we might have remained in that bewildering situation it would be impossible to say, but being gently drawn back by our sable conductor, we returned to the light and consciousness of our position. The volume of water being much greater here than at the Cave of the Winds, and the spray being all around we could not see anything but darkness visible below, and an immense moving mass before, which we knew by feeling to be water. There is some fascination about the place, for after coming out into the daylight I went back again alone, but the guide hurrying after me brought me back, and held my hand until we reached the stairs to return to the Museum. On our way back our guide told us that more than "twice-told tale" of Niagara and Vesuvius. If I may be pardoned for mixing up the ridiculous with the sublime, I may as well repeat the story, for having just come from under the Falls we were prepared to believe the truth of it, if the geographical difficulty could have been overcome. An Italian visiting the Falls and going under the Horse Shoe, was asked, on coming out, what he thought of the sight. The Italian replied it was very grand and wonderful, but *nothing* to the sight of Mount Vesuvius in a grand eruption. The guide's retort was, "I guess if you bring *your* Vesuvius here, *our* Niagara will soon put his fires out." I do not vouch for the truth of the story, but give it as near as possible as I was told. Returning to the Museum and making ourselves "as we were," and comforting ourselves with something inside after the wetting we had got out, we took up our traps, and wending our way back to the ferry, recrossed the river in much the same manner that we crossed over in the morning; and sending our "baggage" up in the cars we thought we would walk up the "long stairs," 290 steps, by the side of the railway. On nearing the top, we felt as if we must "cave in," but having trodden so far the back of a "lion," we determined to see the end of his tail, and pushing on to the top we had the satisfaction of having accomplished the task we had set ourselves. Perhaps before abandoning the Canadian side of Niagara, I should have said something about Table Rock, which, as I have said, is on the Canada side and very near to the Horse Shoe Fall. It took its name from the table-like form it originally presented. It was formerly much larger than it is now, but has, from time to time, fallen away. At one time it was very extensive and projected over the precipice fifty or sixty feet, and was about 240 feet long and 100 feet thick. On the 26th June, 1850, this tremendous mass of rock, nearly half an acre, fell into the river with a crash and a noise like the sound of an earthquake. The whole of that immense mass of rock was buried in the depths of the river, and completely hidden from sight. No one was killed, which was a miracle, for several persons had been standing on the rock just a few minutes before it fell. The vicinity is still called Table Rock, though the projecting part that gave rise to the name is gone. It is, nevertheless, the best point on the Canada side for obtaining a grand and comprehensive view of Niagara Falls.

(To be continued.)

THE PAST AND FUTURE OF PHOTOGRAPHY.

BY JOHN E. CUSSANS.

In the good old days, when George III. was king, the production of a portrait was attended with a considerable outlay of time and money, which was frequently not justified by the results. We can readily understand how this should be, when we find it recorded in "Nicholas Nickleby" that a certain Miss La Creevy was obliged to sit at her window for several hours, in order to catch a passing Roman nose, which she wished to transfer to her ivory. What time the art of portraiture was in this unsatisfactory condition, photography suddenly asserted its claims to general notice. At first but the curious experiment of the philosophic student, it became in turn a recreation and a profession, until at length, so varied are the uses to which it has been successfully applied, it has become almost a necessity to everyone, and a source of livelihood to thousands.

Thanks to this sublime art—for sublime it may truly be called—much of the bitterness of separation amongst friends, and of that great and final separation which we have all at some time experienced, is greatly alleviated. Scarcely any lodging now so poor, but in it may be found the picture of some cherished one. The lessening influence of time may in a great measure efface from our mental vision the form and features of those who are absent, though their memory may still be warm in our hearts, but with these faithful remembrancers before us—shadows less fleeting than the realities—the absent ones seem to return once more to our embrace, and remain with us just as they appeared in life.

The first step in advance of the old-fashioned black silhouettes was, as everybody knows, the discovery of the process known as the Daguerreotype; the portraits produced by this means, however, were mostly, it must be confessed, of a *derogatory type*. Photographers and true friends alike scorn to flatter at all times; but *then*, the former refused to render even common justice. Let us go back in imagination some twenty years, and suppose ourselves present at a "sitting." An amateur—they were all amateurs then—has invited a friend to sit for him. A bright day is of necessity chosen, and the victim is seated in the garden, with a brick wall for a background. The burning rays of the noontide sun are pouring on his devoted head; still more light is the dominant wish of the operator. This is achieved by the aid of sundry mirrors in the hands of his friends, who unfeelingly cast reflections on the unfortunate operatee. With manly fortitude he stares at the lens as directed, until, like some horrid nightmare vision, it seems to distend its yawning mouth, and advance towards him. A giddy mist then mercifully arises before his eyes, and the camera totally disappears. Still he holds out; to yield now, having endured so much, would be weak indeed. In ten minutes the operator puts him out of his misery, and he is henceforth looked upon by his friends in much the same way as a gentleman is now who has been up in a balloon with Mr. Coxwell. Is it to be wondered at that a portrait obtained under these circumstances should be the reverse of flattering?

Quit we now the reminiscences of the past, and come we to the present. Many and great have been the improvements in the photographic art. The back garden we wot of is superseded by a commodious *studio*, with appointments as elegant and costly as a lady's boudoir; and the time of exposure is reduced from ten minutes to three seconds.—*Mores et* TEMPORA *mutantur*.

Many photographers who embarked in business but a few years since have undoubtedly realized ample fortunes, and many others are rapidly attaining the same happy consummation; but the question is frequently asked with some degree of anxiety, are not the best and most profitable days of photography past? Are there not unmistakable symptoms of cartes de visite dying out of public favour, as stereoscopic pictures have? That there is some slight cause for apprehension on the part of those who have made photography their profession, the most sanguine optimist can scarcely deny; yet not to that extent which many photographers on whose receipts nearly four months of bad weather have wrought a manifest influence, may imagine. True it is that the same amount of profit is not obtainable now as formerly, and there is not perhaps so large a demand for cartes as existed two or three years since; but as long as vanity or affection form any part of human nature, so long must the services of the photographer be called into requisition; and if those services demand a combination of taste, skill, education, and capital, so long will the true artist be enabled to hold his own against all ignorant and unskilful dabblers. Unfortunately, anyone can, with ten minutes' instruction, take a photograph of some sort; in the same manner that anyone can paint a picture. When a man has failed in his own business it is said that he becomes either a schoolmaster or coal agent; to these may be added photographic *artist*. Twenty pounds will frequently suffice to set up a *studio*, including apparatus for small positives and cartes, and perhaps the plant and goodwill of an eel-pie shop attached. The proprietor having spent nothing on his previous education, and being at little or no current expenses beyond materials, is content to charge a proportionate sum for his productions; and many persons of the lower class and servants—whose money is just as good as their betters'—are induced by the lowness of the price to patronise him instead of some respectable and competent artist. Thus complains the desponding and short-sighted photographer; but it should be rather a subject for gratulation than otherwise, that the carte fever has in some degree abated; for in its place has arisen a demand for enlargements and direct photographs of such a size that no small amount of capital and skill is required on the part of the operator. "So you've set up school, Sam," I once heard a hack-driver say to a coloured man, in Springfield, Illinois. "Oh, yas; I begun Monday." "How much do you get?" "They pays three cents a week." "That's mighty little, ain't it?" asked the hack-driver. "Wal, 'tain't much, sure," was Sam's rejoinder; "but then you see it's mighty poor schoolin' they gits." It is hardly necessary for me to point out the analogy between the uneducated and unskilful photographer, and the ingenuous Sam.

Photography has been so long practised as a profession, that it has assumed a certain recognized position, the same as the higher professions; and although among these there may be advertising quacks, and unscrupulous pettifoggers, the class of clients for whom they act would seldom, if ever, employ gentlemen who, to reimburse themselves for the years of study by which they have qualified themselves for their positions, are compelled to charge a higher fee. Granted that the photographic *mechanic* may succeed in obtaining the patronage of a certain class of people, it matters little to the photographic *artist*; for his charges, though only just, and commensurate for the services he renders prove an effectual bar to at least nine-tenths of such customers. It is a fact beyond dispute, that the more appreciative, and therefore more exacting, portion of the public cannot be induced to purchase an inferior article, more particularly one of luxury, solely on account of its cheapness. In the case of a photograph, they will not be content with the mechanical excellence of the work; but require that the skill of the artist should also be reflected therein. Then let the "Imperial Card Company of Yokohama, Limited," advertise their unequalled portraits at two and sixpence a dozen, there is ample scope and verge enough for us all.

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LIGHT SKETCHES.—No. 1.

BY A PHOTOGRAPHER'S ASSISTANT.

"Their cause I plead—plead it in heart and mind,
A fellow feeling makes one wondrous kind."

"Have yer likeness taken, sir? Kre'k portrait. Neat frame and all for sixpence. Won't keep yer a waitin', sir. Walk inside, and you'll be took off in a minit."

Taken off! Where? Good gracious! Do photographers in London kidnap people? Are they agents for the disunited states, entrapping the unwary to supply fresh fuel for unhappy destructive war? Where are the police? When folks see things going wrong, they ease their excited feelings by exclaiming against the police, and why should not I? Again I repeat, Where are the police? No, Sir Richard Mayne, I don't want you; I mean the photographic police, the censors, News, *Journal*, *Notes*, and so on. Why do they not do their duty, and put an end to this vile system of "touting?" I don't like begging, and I did not feel an increase of pride in my profession when the words that form my text fell upon my ear a few months since, as, on a dull foggy Sabbath morning I picked up my path through a dust-carpeted street in and belonging to the salubrious borough of Southwark. After satisfying the gentleman that accosted me, by convincing him I was a person of no ambition, and, therefore, entertained no desire to be "took off," I stopped a moment to examine the specimens exhibited. (They must all of them have been taken on foggy days—luckless "artist!") Whilst the touter moved off to rehearse his lesson to other ears, which was executed in a style that would reflect credit on a railway guard or porter when they shout a curtailment of the names of stations and junctions. Poor fellow! he was shabbily attired, his face pale and careworn. He looked hungry, and doubless felt so; and his quick eye scanned each passer by, to whom he continued to address the well-worn query, "Have yer likeness taken?" I pitied the supplicant, yet could not but admire his perseverence; and as I listened to his voice, a panorama moved before the eyes of my imagination. Cab-horses, policemen that are not blessed with a taste for street-fights or rows in general, milkmen's donkeys, gate-porters, wretched needle-women that cannot afford to purchase an hour's sunshine, misery in every form that inhabit the prison of monotony; and after examining each object as it passed before my mental view, I cast a parting glance at my poorer brother, and hurried from the scene with the words ringing in my ears, "Have yer likeness taken." Unfortunate man, what a life is his! Has he an active mind? If so, then must his lot be more intolerable than any of those that peopled my mental panorama.

"Have yer likeness taken." Happy faces are gliding past. The steamer, "'bus," rail, await them; and soon the smoke will fade in the distance and bright sunshine, health-recruiting breezes charged with the juices of blooming heather, green fields and lovely scented flowers, blue sky, a bonny vaulted dome, where fleece-like clouds are sporting, and from whence golden floods of light descend to dance on the white-crested ever-restless waters; a trip to the Surrey hills; a laughing, romping tea at Greenwich; or a ramble on the beach at Brighton; the fountain rolls on a gushing stream, and, amid its roar, the oft-repeated cry is lost, "Have yer likeness taken?"

The Sabbath bells are chiming, steadier less elastic steps wend through the street, Prayer-books and Bibles held visible, remind us that some at least would wish to make a foul Babel a Christian city; and from them a kind and pitying glance replies to the never-ending question, "Have yer likeness taken." Alas, poor slave! The sunshine befriends your master, and will he never allow you a scanty share? Let these words assail and penetrate his ears. Go to, man. Why for ever gazing on curtains, pedestals, chairs, and tables? Why toil and toil from camera to dark room, and from dark room to camera, until your eye-balls ache, and your lungs are weakened by the poisonous fumes of cyanide and ether? Are there not six days for labour? Shut up your shop, then, on the seventh. Make it a day of recreation, if you will not have it a day of rest. Go, inhale the life-renewing breeze. Drink deeply from the spring of Nature's beauties. Go, where every ray of light is a magic pencil, painting scenes of loveliness; flowery meads, and budding beauty. Drink deeply. Drink—perchance ye may drink of inspiration.

"You do not see anything so beautiful as money-taking." Then may your heartless money-grubbing propensities perish with you! Stay at home. But let your slavey go. Bind not the spirit that would soar aloft, nor dare to stay the feet that fain would seek a grassy carpet, the lungs that pine for purer air.

"Have yer likeness taken." And is a noble art compelled to beg? The beautiful operations connected therewith only to be coaxed into action by pittance derived from whining—abject begging? Shame! shame!! When oft inclined to dwell on the nobility of photographic science, "Have yer likeness taken," re-echoes through my brain; I feel degraded, my pen falls soul-less, lifeless, dead.

"Have yer likeness taken." Sunny days have passed away; the rude winds are whispering, wailing, sometimes shrieking, as they force their way through crevices and key-holes; cumulous clouds join in darkened groups; the air is chilly, biting, icy cold, and yet, if aught up-light remains, the shivering, trembling cry from freezing lips is heard, "Have yer likeness taken!" Unhappy mortal, a sorry fate is thine. Thy master does not pity thee. Then, take pity on thyself; eschew dram drinking, though you love it; work; dig; anything; accept only, as a last resource, a post that bids ye be a slave to the doleful cry—"Have yer likeness taken."

ON THE EMPLOYMENT OF ORGANIC SUBSTANCES IN PHOTOGRAPHY.

BY M. MC. A. GAUDIN.

The improvements of which photography is capable seem illimitable, not so much by employing products of the mineral kingdom, upon which researches have been principally directed up to the present time, but rather in putting under contribution the substances of the organic kingdom, which are many thousands in number, arranged by an insensible gradation, and by their vegetable origin, recognizing for the most part light as the most active agent of their generation; and consequently, from the moment we have ascertained the products of the metamorphoses by light in one of them, we shall have a new photographic process, which will find its special employment, like all those which have been discovered, and are limited to the employment of mineral substances.

The first inventors of the photographic art employed organic substances exclusively: for Niepce's process is based upon the resinification of an essential oil: and notwithstanding its slowness, this process is successfully applied nowadays to photolithography and to photolithographic engraving. Then came Daguerre's process, based exclusively upon the employment of mineral agents, which flourished for some ten years, yet could not by its ideal perfection redeem certain defects inherent to its very method of production. Lastly came a mixed process, which consists in associating mineral and organic matters together, such as albuminous, gummy, or gelatinous substances with a superoxygenated body: and this process has become universally adopted for photographic printing during the last few years.

We have also an excellent precedent for the employment of organic substances in acetic, citric, tannic, gallic, and pyrogallic acids, which render such great services, and which we can with difficulty only do without in photography on paper; but these constitute a very small portion of the wealth of the organic kingdom. I have before me a German book which contains a summary of three or four thousand organic substances, with indications of their atomic form, and one half of which, at least, contain chlorine, bromine, or iodine; so that by introducing them either into the silver bath or into the collodion, there is every reason to believe that by their aid we might attain actual instantaniety; for by their number and mixture we may obtain innumerable combinations, which chemists of the present day, learned as they are, have not foreseen.

For example, my attention having been recently drawn to the employment of *phenic acid* in medicine, I remarked that this phenic acid differred from *benzine* by the addition to the molecules of the latter—consisting of six atoms of carbon and six atoms of hydrogen—of an atom of oxygen, which stands in the centre: that benzoic acid differs from benzine by the addition to its molecule of a molecule of carbonic acid, which serves as an axis to it; that pyrogallic acid differs from benzine by the addition to its molecule of three atoms of oxygen, which also serves as an axis to it. Gallic acid and tannin differ also from benzine by an addition of new atoms too complex to admit of explanation in this place.

This has suggested to me the idea that phenic acid may be employed in photography as a reducing agent, in lieu of pyrogallic acid, as it is much less oxygenated, and I expected to find such an exceptional reducing power in it that I dared not venture to propose to a photographer to permit me to make experiments in his laboratory. I feared that the mere emanations from it would derange all the chemicals.

Having made the experiment, I recognized that my fears had no foundation. I added phenic acid to the silver bath without remarking any reduction of consequence; I added to collodion a large proportion of phenic acid, dissolved in alcohol, and so far from causing fogging, this collodion gave me cleaner negatives than the same collodion without this addition, with a striking increase of sensibility. The same result also occurs with tannin, but the collodion eventually becomes bad; on this account I could not judge with certainty of the effect of phenic acid, until the expiration of a week at least, but at present it seems to me to act exactly like tannin, and if it were not volatile I should say that it might be substituted for tannin.

This simple statement therefore shows the extent of our resources, and how little we know, *à priori*, of the part a new substance will play in photography. And in taking into account the enormous difficulty that exists in distinguishing the organic substances which form a given mixture, we have before us an inexhaustible mine and a real treasury of secrets.—*La Lumière.*

ON TAKING A GROUP.

BY H. J. MARIAN.*

Before the holidays we called on friend B—— at his gallery, and found him quietly musing over his prospect of the good time coming, and concluded to spend a few moments in conversation with one so experienced in the art. While busily engaged discussing things in general, we were interrupted by a young gentleman who came to enquire what Mr. B—— would charge to take a group of young men, six in number.

The answer being satisfactory, he went out, saying he would return again with the rest in half an hour. Everything in readiness, and having despatched one customer, we were again discussing matters, when the gentlemen came in and very soon were ready to take their position before the camera.

Mr. B—— prepared a plate, adjusted the camera, and told the gentlemen he was now ready, and would be pleased to have their kind attention for the few moments, and he would not keep them longer than necessary.

The spokesman of the party, who we will call Frank, replied that they wanted a good picture, and of course to get that it was necessary to obey the instructions of the operator.

The rest nodded assent, and so far it promised to be a very nice group, as they were arranged in very good taste.

As everything was now ready, Mr. B—— got the focus, put the plate in the box, and had just taken off the cap, when one of the party felt restless, and drawing one of his feet towards him, took the attention of all, and—that negative was useless.

Mr. B—— said nothing, but taking the negative out, laid it aside and prepared another plate.

Frank said that would have been a good picture if Bill had kept his feet still.

Being in readiness again, Mr. B—— thought he would make sure of Bill this time, and bringing out the head-rest, said—

"Let me fix your head in the rest."

"I would rather not; I can hold my head still."

"But, then, you are restless, and it will steady you."

(Bill thought not, but finally consented.)

"There, now gentlemen your attention again, if you please, and we will have a good picture. Frank, raise your chin a little, there, that will do. Now, steady Bill."

The others remained like statues, cold and indifferent.

The camera adjusted again, and the eyes of all on the spots indicated by Mr. B——, the cap off, and watch in hand, the seconds were timed.

To Bill it was a lifetime—his lips twitched, and his mouth puckered, though he bravely stood firm. But such a face!

"That will do," said B——.

"I am glad of it," says Bill, getting his mouth in shape and supposing all was right.

The plate being removed and washed, it was shown, B—— remarking it would have been an excellent one but for Bill's face.

Frank thought it very good, and wanted to know if Bill's physiog. could not be removed or left out in the printing.

B—— thought not, as it would spoil the effect. And to satisfy the party, he would give another sitting. But this time gave them to understand that his politeness was worn out, and he would charge them for the picture whether good or not, but they might have their preference of the negatives.

One of the young men complained of Bill having spoiled the picture, and suggested that if he could be made to take a comical part, it would not be noticed so much.

Another thought he might be left out altogether, but as the picture was for the club-room the group would not be complete, and if they could not do better, they would take negative No. 2.

Another plate in readiness, and the party arranged again, Mr. B—— went through the manipulations, and this time succeeded in getting a picture, but not as good as desired.

After removing the plate, fixing, and washing, the negative was shown, and Mr. B—— desired to know from which negative he would print the desired compliment. Other customers being anxious to have a shadow caught, B——'s attention was taken from the party, and after some deliberation he was informed to have a half dozen of each of negatives Nos. 2 and 3.

As they passed out of the room, one of the party might be heard whistling—

"I'm not myself at all," &c.

We supposed it was Bill.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 8th March, 1865.

The seventh exhibition of the *Société Française de Photographie*, of works in every branch of the art, will be held in a department of the *Palais de l'Industrie*. It will be open from the 1st of May, next, to the 31st of July.

Articles intended for exhibition must be sent, carriage paid, to the secretary of the society, addressed "*M. Martin Laulerie, au Palais de l'Industrie, porte No. 1,*" between the 1st and the 10th of April, after which date nothing will be received. The articles sent must be accompanied by a note, describing them, signed by the exhibitor, who must protect his specimens by glass frames or passe-partouts. In order to save expense to exhibitors, and avoid damage in transit, the committee invite them to send their pictures in portfolios to their correspondents in Paris, who can have them framed and sent in by the date above mentioned. In such cases, the exhibitors must notify the secretary, M. Martin Laulerie, of their having done so, and furnish him with a list and other particulars, addressed to him direct, at *Rue Cadet, No.* 9.

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* From the *American Journal of Photography*.

For the convenience of such foreign exhibitors as have no agent in Paris, the secretary of the society will undertake the framing of proofs sent to him loose in portfolios, as economically as possible. In such cases they must reach him between the 1st and the 5th of April at the latest.

The works that will be inadmissible are coloured proofs, and those retouched in such manner that the jury must regard them as exhibiting qualities not strictly due to the photographic art. Pictures that have been already exhibited by the society are also inadmissible.

Proofs representing subjects exhibited by the operator, but not printed from the same negatives, and presenting a new interest, either from the process employed, or by the merit of their execution, will be admitted.

Exhibitors may inscribe their names upon single proofs, or upon the frames containing two or more proofs. They can also add their place of residence, but any card or document possessing the character of an advertisement will not be allowed on or in the frames.

Beside the description of the proof, for insertion in the catalogue, the process by which the negative was obtained, such as collodion, wet or dry, albumen, waxed paper, &c., must be briefly stated. Any other information respecting the negative or positive processes adopted will be gladly received.

No statement of prices will be allowed upon the proofs or frames, but exhibitors may supply that information to the secretary, to enable him to reply to enquiries.

No picture can be withdrawn from the exhibition before it has closed, even if the time of exhibition be prolonged.

Works sent in for exhibition will be examined by a jury, who will decide as to their admissibility.

The committee do not desire to limit the number of works exhibited, but they recommend exhibitors to exercise a wise discretion in sending only their best works, especially portraits and *cartes de visite.*

The jury appointed by the society, on the 12th ultimo, consists of the following members: — MM. Aguado, Bayard, Bertsch, Cousin, Davanne, Delessert (Benj.), Leon Foucault, Galliard, le Baron Gros, Hulot, Jeanrenaud, le Comte Laborde, Lemaitre, Peligot, Ravaisson and Robert.

The President of the society, M. Regnault; C. Balard, President of the committee; Paul Perier, Vice President of the committee; and M. Mailarad, Secretary-general, are also *ex officio* members of the jury.

The articles exhibited must be removed during the week that follows the closing of the exhibition.

M. Niepce de Saint Victor has presented to our Photographic Society one of the earliest photographic proofs obtained by his uncle Nicéphore Niepce This proof is a copy of an engraving of Cardinal Amboise, and bears the following inscription:—"The first heliographic result obtained in 1824, by J. Nicéphore Niepce, printed from the original plate in 1864, by M. Jules Chevrier, de Chalons. Presented to M. Niepce by J. Chevrier.—Respectfully presented to the *Societé Francais de Photographie,* by Niepce de Saint Victor.

The President, in the name of the society, thanked M. Niepce de Saint Victor for his gift of this heliographic proof, which comes very opportunely to complete the historic collection which the society undertook to form when it was first established, and of which it would be very difficult, if not impossible, to combine the various elements anew at the present day.

M. Aimard, in the name of the Administrative Committee, made the following communication:—

M. Petrini, an amateur photographer of Marseilles, has addressed the President a letter, in which he begs the society to give him its opinion upon a process represented as a new one, which occupies much attention at the present time, and which is known by the name of its inventor, M. Wothly.

It would be difficult for the society to comply with M. Petrini's request, and to express its opinion upon a process, some results of which have been submitted to it, it is true, but of which the mode of operating has not: the question is the more delicate, since pecuniary interests are involved in it, and the society has adopted the rule of never interfering in questions of that kind.

All that can be said on the subject will be found in the Society's Bulletin for January last, in the description of the patent taken out in England by M. Wothly, and consequently, it will be easy for everyone to appreciate the analogies which this process presents or does not present with previous methods, and especially with those published by Mr. Herschel and M. Niepce de Saint Victor.

The Committee appointed to award the annual medals which the society will distribute in the present year consists of the following members:—

MM. Davanne, Fordos, Foucault, Girard, Leon de Laborde, Martin, and Robert.

M. Mathieu Plessy begged the President to appoint a committee to report upon the aniline colours for colouring positives, prepared by M. Javal.

The President acceded to M. Mathieu Plessy's request, and named MM. Bayard, Davanne, and Fortier, members of the committee.

The President announced that the society would open its seventh International Exhibition of Photography, at the *Palais de l'Industrie,* on the 1st of May next, upon the same conditions, and under the same regulations, as were adopted with the Exhibition of 1864.

The Abbé Moigno made the following communication upon the subject of the recent experiments of Professor Tyndall:—"By concentrating by reflection on the surface of a small silvered mirror the rays emitted by the carbon points of an electric lamp, we obtain a cone of convergent light. If we interpose in the path of this concentrated beam of light a trough containing an opaque solution of iodine, the light of the cone is entirely destroyed, while its invisible rays are scarcely intercepted. They converge in a focus with which (although nothing can be seen of them in the darkest room) we can produce the following series of effects:—

"When a piece of black paper is placed in the focus, it is pierced by the invisible rays, as though it had been suddenly penetrated by a red-hot wire. The paper instantly takes fire, although nothing hot in appearance has touched it.

"A piece of brown packing paper placed in the focus soon exhibits a surface heated to redness, burning a considerable space of the paper, which finally takes fire.

"The wood of a hat-box, similarly placed, takes fire rapidly. A heap of wood and shavings upon which the focus falls, quickly inflames, and we can thus light a fire with invisible rays.

"A cigar or pipe of tobacco is immediately lighted when placed in the focus of the invisible rays.

"Discs of carbonized paper and of wood or charcoal placed in the focus, became brilliantly incandescent.

"A piece of charcoal suspended in a receiver filled with oxygen gas, takes fire in the focus, and burns with the same splendour which this substance presents in an atmosphere of oxygen. The invisible rays, although they have passed through the receiver, still retain sufficient power to raise a white heat.

"A mixture of oxygen and hydrogen is exploded by the invisible focus upon heating the envelope.

"A strip of blackened zinc placed in the focus is pierced and inflamed by the invisible rays. By causing the strip to pass gradually through the focus, it can be kept brilliant with its peculiar purple light for a considerable time. This experiment is particularly beautiful.

"A magnesium wire, suitably placed in the focus, burns with an almost intolerable splendour.

"The effects above described are due in part to chemical action. The bodies placed in the focus are oxidizable substances, which, when sufficiently heated, are attacked by the oxygen of the atmosphere, and give ordinary combustion as the result. But the experiments can be sheltered from this action. A thin plate of charcoal, placed *in vacuo*, is rendered incandescent in the focus of invisible rays. Here chemical action is entirely absent. A thin piece of silver or of copper, having its surface covered with a light coating of the sulphide of the metal, is rendered incandescent both *in vacuo* and in the air. With a pile of sufficient power and proper concentration, a plate of platinized platinum is heated to whiteness in the focus of invisible rays; and when the incandescent platinum is viewed through a prism, the light exhibits a complete and brilliant spectrum. In each of these cases we have first a perfectly invisible picture of the carbon points formed by the mirror; and hitherto no experiments have been made which show more decidedly the identity of light and heat. When the charcoal or plate of metal is placed in the focus, the invisible image renders it incandescent, and visibly imprints itself upon the plate. In withdrawing or approaching the carbon points, the visible image of the points shows their motion. By cutting the outline of this visible image with the charcoal disc, we can obtain a second couple of carbon points of the same form as the first, but turned in the opposite direction; and with the rays emanating from a couple of carbon points, powerless to excite the sense of seeing, we obtain a second couple capable of emitting all the rays of the spectrum. We know that the ultra-red radiation of the electric light consists of ethereal undulations of greater length, and of slower recurring periods than the radiation that produces vision. When, therefore, these long undulations fall upon a plate of platinum and render it incandescent, their periods of vibration are changed. The undulations emitted by the platinum are shorter, and recur more rapidly, than those which fall upon it: the refrangibility is consequently rendered stronger, and the invisible rays are rendered visible. Thirteen years ago, Professor Stokes published his celebrated discovery, which consists in rendering the ultra-violet rays visible by the action of sulphate of quinine and several other substances. The invisible rays having great refrangibility, and falling upon a suitable medium, cause the molecules of this medium to oscillate in longer undulations than the incident undulations. In this case then the rays are rendered visible by diminishing the refrangibility, while in the experiments of Professor Tyndall, the ultra-red rays are rendered visible, because their refrangibility is augmented. To the phenomena discovered by Professor Stokes, we give the name of *fluorescence*. Professor Tyndall proposes to give the name of *calorescence* to the phenomena above described.

At this meeting MM. Mathieu Plessy and Berthaud fils, made some experiments with Messrs. Grant and Solomon's magnesium lamp, upon a bust of M. Daguerre, and also a portrait from life of M. Martin Laulerie, the secretary. The results were as follows: of the two negatives taken of the bust, the one exposed 50 seconds was over done; the other exposed only 35 seconds was good, and quite satisfactory. The portrait from life, taken in 120 seconds was quite successful. An engraving copied in 30 seconds, gave a good negative: another copy to which 60 seconds was given was completely burnt.

PHOTOGRAPHY IN GERMANY.

Berlin University, March 6, 1865.

Sir,—M. Kleffel, of Geldburg, has made many experiments with your new printing process, and he is very much delighted with the result. At the last meeting of our photographic society he exhibited a collection of such collodion prints, which were very fine. He asserted that the process is much more sensitive than the Wothly process, but is similar to the last in regard that negatives of a certain thickness are necessary to it.

M. Grüne, our eminent chemist, read a paper on the coloration of negatives, now so much recommended in France. He pours over the fixed negative a solution of per-chloride of mercury, or per-chloride of copper, or per-chloride of iron, then he treats the plates with iodide of potassium, giving a yellow tint, or red double cyanide of iron and potassium, giving a green tint, varying in regard of time of the treatment. He is now making experiments on this point, which he will publish in the next.

M. Burchardt, photolithographer, has tried the application of engraved zinc plates, produced in photozincographic manner, for book printing in the ordinary printing press, instead of wood engravings. I hope that this new application of photography will have great success in future.

Photographs burnt in porcelain and enamel, for some time produced only by M. Lafon de Camarsac, in Paris, are now made in Germany in great quantities, and very cheap, by M. Grüne and the royal manufacturer of porcelain in Berlin, Obernetter in Munich, and Lesu in Vienna. M. Grüne requires the negative to be sent for this production. Recently he has prepared a peculiar collodion for removing the film from the glass plate. Pour on this collodion over the finished negative (varnished or not), let dry, and remove the film, which is elastic, similar to india-rubber, very durable, and very useful for sending with a simple letter.—Yours faithfully, Herm. Vogel.

PANTASCOPIC CAMERA.

Sir,—Mr. Johnson writes that the version in my letter of what I said at the Photographic Society's meeting does not accord with the recollections of himself and his friends, because in expressing the purport of my observations, I used the words "on the plane surface." If he and his friends will bear in mind that I was addressing myself entirely to the pictures on the table, which were pictures "on the plane surface," taken in panoramic projection, and that my observations could have no meaning at all otherwise, I think it must be at once allowed that I have correctly given the substance of what took place. I am glad to find that what I said is now admitted to be a "truism." I certainly considered it such at the time, and was surprised to find it received by Mr. Johnson as if it admitted of controversy.

Here I might now fairly have left the question as settled, but Mr. Johnson has introduced some other matters connected with the subject, on which I would like to say a few words, lest by silence I might be thought to acquiesce in his views. Plane projection and panoramic projection are, of course, both geometrically true. No one with any knowledge of geometry would think of disputing it. I never placed the one in antagonism with the other, though the heading of Mr. Johnson's letter would seem to imply that there was such an antagonism. I must protest against the fitness of such a heading as descriptive of the question at issue. Each is true in its place, but when the panoramic view on the curved surface is opened out on to the flat, the representation is no longer true, it is, in fact, a distortion, as everyone acquainted with geometrical principles must admit. Such is the case with the pictures taken in Mr. Johnson's camera, as exhibited at the Photographic Society.

In the early days of photography, the want of a lens which would take views up to sixty degrees was no doubt an imperfection, inasmuch as it circumscribed the powers of the photographic artist, but that the landscape artist requires a means of taking pictures on the plane surface of greater angle than this, I cannot admit. There are plenty of lenses now which accomplish this. I may be asked why dogmatise on sixty degrees? simply because nature has so arranged the power of man's eyes. More than about sixty degrees for a picture on the flat surface is not required, because that is about the angle which the eye takes in at a glance, without turning the head. As soon as the head is turned the picture is then, in fact, at once referred to a different plane, and, practically, becomes a second picture, with its own system of perspective lines; it is no longer part of the previous picture. The two pictures may be placed side by side, but they never make one picture.

It is usually laid down by all writers on art, of any authority, that a picture should include an angle of about sixty degrees, and it seems to me that the rule is well founded, It is no reproach to plane perspective, as Mr. Johnson would seem to imply, that it cannot perform the impossibility of projecting, on a plane surface, objects more than 180° apart, in other words, accomplish the astounding feat of seeing things which are out of sight. Even the pantascopic camera cannot accomplish this, as Mr. Johnson would seem to imply, that it can.

Suppose a picture taken by the pantascopic camera of 360°, open out the cylinder and lay it out flat, and let the line of division happen to run through a house, or any other object, what is the consequence? why that one-half of the object is at one end of the picture, and the other half at the other end. Is this true? is this artistic?

I will not take up your space by entering at length into the numerous points to which Mr. Johnson refers; many of them as geometrical propositions admit of no controversy, and it is upon them that I rely, as all tending to bear out and prove what I originally stated, that the pictures produced by Mr. Johnson's camera, when opened out and shown as flat pictures, as was the case at the Photographic Society, are not true, but distortions, and necessarily inartistic.

Mr. Johnson expatiates on the numerous advantages arising from the use of his camera. I confess I do not appreciate them so highly as he does, though I am not prepared to deny that possibly under certain special and exceptional circumstances of a very limited character, it may be found useful. For all general purposes it appears to me that views taken in the usual way, of 60° angle, and if necessary six of them embracing the whole of the horizon, will not only accomplish all that is needed, but accomplish it with truth and accuracy and artistic delineation, which the picture taken by the pantascopic camera, and printed on the flat surface, does not exhibit.—I am, sir, your obedient servant,

P. Le Neve Foster.

SUGGESTIONS FOR A SUCCESSFUL PHOTOGRAPHIC EXHIBITION.

Sir,—Having given insertion to my remarks in reference to a prize photographic exhibition, I am induced to submit to your notice a few more suggestions in furtherance of that object, which, if adopted, I believe would be conducive to the best and highest interests of the photographic profession.

As stated in my former communication, the prize exhibition should be connected with the ordinary photographic exhibition of the society, shown in a separate room or compartment, but without any additional entrance fee.

The adjudicating committee might consist of 12 members, comprising artists, engravers, photographers (non-exhibitors) and art critics.

That it be at the option of the society to purchase the negatives of any subjects which obtain prizes, with the view of publishing the same, the competitors placing their own price upon their works previously to the exhibition being opened. This arrangement would probably ensure to the society an additional source of income, there being little doubt but that a large sale of the prize pictures would readily be obtained. The exhibitors would, no doubt, send several subjects, perhaps as many as a dozen might be allowed to each.

The amount and number of the prizes would of necessity be managed according to the sum raised by entrance fees and subscriptions.

I think it will be desirable to class the works according to their size, that is, a 1st, 2nd, 3rd, class prize for pictures ranging say 20 × 15 inches, same for those 12 × 10 and under, because otherwise many good photographers who have only small instruments, would stand no chance with those possessing large apparatus.

While upon this subject, and with the same ulterior object in view, viz., the elevation in social status of the photographic practitioner; it appears to me that there would be no great difficulty in obtaining the Royal patronage to the Photographic Society; then, when obtained, let it be called the Royal Photographic Society; let fellowships be instituted for gentlemen of scientific and eminent artistic photographic abilities, with the privilege of placing the letters F.R.P.S. at the end of their names. Why not F.R.P.S. carry weight as well as R.A. or F.R.S.? at all events this honourable distinction would draw a line of demarcation, between those entitled to it, and the too numerous self-styled artist photographers of the day, who, whatever may be their merits in making photography successful as a commercial speculation, only cause a stigma and reproach to it regarded from a fine art point of view. Trusting these hints will not be considered premature, but that they will find favour in your eyes, and those of other gentlemen of influence, I am, sir, your obedient servant, A. N.

[In order to enable the Photographic Society to confer a diploma, entitling the members to such initials as F.R.P.S., it would require to obtain a charter, and this involves a cost of several hundred pounds at the outset.—Ed.]

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Photographic Notes and Queries.

Aniline Colours for Photography.

Sir,—With reference to Dr. Jacobsen's Aniline Water Colours, will you allow me to say that I have been getting those colours from that gentleman since *November last*, and at my request he made an English copy of his instructions (which I enclose). I send also a picture tinted with these colours. My customers generally express themselves much pleased with the results obtained.—I remain yours truly, John Spencer.

30, *Enoch Square, Glasgow, March* 6, 1835.

[We shall probably give some extracts from these instructions in our next.—Ed.]

Masking Negatives.

Sir,—In your "answers to correspondents" last week, you gave a method of blocking out skies, or parts of skies, by "blackened photographic paper," but as this in a soft negative with foliage three parts up the picture must necessarily result in hardness, I think I can give G. R. B. a better hint, viz. Procure a bottle of Harvey & Reynold's opaque chromotone, and with this coat the *back* of the negative to within an inch of the horizon, trees, or whatever else may bound the sky. while still wet, coat with clear water from the opaque colour to an inch *below* the sky line, and with a long camel's hair brush soften the hard line off to the clear water.

It is simple to do, and if well managed the greatest softness may be obtained, no matter how the foliage cuts up the sky; and the results are far more artistic than can be obtained with "blackened paper."—I am sir, Yours respectfully,

Brighton. Wm. Pousty.

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Talk in the Studio.

Berlin International Photographic Exhibition.—The Berlin Photographic Society have acquired for the photographic exhibition in May and June, 1865, one of the most beautiful and largest rooms in the town, the *Tonhalle*, the size of which is larger than the space occupied by the photographic parts of the International Exhibition of 1862. The exhibition will be opened the 15th May and close the 1st July. Articles for the exhibition are exempted from duty.

Dublin International Exhibition, 1865. Fine Arts Department. Class F. The allotment of space for the photographic pictures, is rapidly progressing under the superintendence of Sir J. J. Coghill and the sub-committee, and the result will very shortly be issued to the applicants. The sub-committee consists of Francis Brady Esq., Q. C., Hercules MacDonnell, Esq., Thomas Brownrigg, Esq., H. Vickers, Esq., and Sir J. J. Coghill, Bart. all good men of business and photographers.

Lecture on Photography.—An able and interesting lecture on photography was delivered a few days ago in the Rusholme Public Hall and Library, by Mr. A. Brothers of Manchester. He devoted the first part of the lecture to the history of photography from the commencement of the century to the present time, and illustrated his subject throughout by a large number of experiments in connection with the collodion process and the chemical action of light. A novel experiment was made by showing the development of a picture, the process being conducted in a properly prepared trough, which on being placed in the oxyhydrogen lantern the audience were enabled to see that when the developing solution was poured into the bath, or trough, the latent image gradually made its appearance on the screen. This was an entirely novel experiment, suggested to the lecturer by Dr. Roscoe, and proved highly successful. A portrait was taken by means of the magnesium light, and a good negative obtained. Previous to the introduction of this light for photographic purposes, an illustrated lecture on photography was almost impracticable, and the use of the metal was shown in some very remarkable experiments. Mr. Brothers has favoured us with a print from the negative taken during the lecture. It is excellent in all respects, and especially artistic in the management of the lighting.

Amateur Photographic Tourists Club.—A club amongst amateur photographers, for practising photography in the field, in a systematic manner, is now organized under the secretaryship of Mr. Frank Howard. In our next we shall give some details of the rules and arrangements already decided upon.

Cyanide of Potassium in the Bath.—Two or three correspondents have written since the appearance of our recent article on this subject, stating their successful employment of the remedy. Mr. R. Dawes says:—As a constant subscriber of the News, I am greatly indebted to you for your remarks on the use of cyanide in rectifying the silver bath. I have tried it since reading your remarks, with perfect success. I had two bottles of bath upon my shelf, that had been set aside, as "used up," although I knew they contained plenty of silver to work well. So I resolved to try your plan. The result was, they worked admirably, producing fine clear pictures, bold and full of half tone. Better then I could get out of a new bath that I had just made up, with less exposure.

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To Correspondents.

G. R. B.—Excessive bronzing in the shadows of prints generally arises from very great excess of nitrate of silver in proportion to the chloride present, and when it is present to such a degree that a bronzed surface continues after proper fixing, it is necessary to reduce the strength of the nitrate of silver solution.

T. W. K.—One cause of the silver solution standing on the surface of the collodion film like dew drops, or running in greasy streaks, is the horny character of the collodion. Sometimes a drop of distilled water added to each ounce of collodion will prove a remedy for this, and sometimes age alone will change this condition. Sometimes moving about in the bath very thoroughly before removal will effect a cure; and in all such cases as yours it is very important to let the plate rest on pieces of blotting-paper at the corners of the dark slide. 2. Citric acid, or citric and acetic acids, should be used in an intensifying solution of iron. 3. Your negative is slightly under-exposed and over-intensified, and the figure is a little awkward in position.

J. R.—The strip of metal you enclose is a piece of magnesium ribbon. We ignited it without difficulty; but a little care is required to secure ready ignition. It is unwise to attempt to light the ribbon or wire in the flame of a candle or anything which yields much soot, as the surface of the wire is soon covered with a black smoked coating, which protects it from the flame; again, you will find that it ignites much more readily if you push the end of the wire, or ribbon, right through the flame, rather than just place the end into the flame. 2. When a conical tube is attached to a lens to screen it from the light, it is difficult, if the cone project far, to take the cap of the lens on and off. It is best in such case to have a door or shutter attached to the lens, or inside, which can be easily closed and unclosed.

R. S.—"The Philadelphia Photographer" costs in Philadelphia 1s. 3d. each number, or 12s. 6d. a year in advance (for the unbound numbers). Probably it may cost you a trifle more obtained from the agent in London; but we are uncertain. The "American Photographic Almanac" is published in New York at half a dollar, or 2s 1d. sterling.

Enquirer.—Copyright in engravings extends for twenty-eight years from the date of first publication, which, if the copyright be protected, will be found on the engraving. If there be any doubt as to a copyright existing you had better get the permission of the proprietor of the copyright, who, if you explain all the circumstances and the object in view, will probably grant you permission.

G. Thompson.—Your lighting is not bad now; but would be improved by a little more side-light on the lighted side.

R. A. Reeks.—Personal application is necessary at the Registrar's Office in in Stationers' Hall, either by yourself or agent. If you send up a stamped and directed envelope, and as many penny stamps as you require forms, to our publisher, he will get them for you. He also will deliver the forms you fill up, and the fee, at the office. If you require more detailed instructions write to him.

O. W. S.—It is probable, from the appearance of the Wothlytype print you enclose, that either it was under-printed, or that it was kept an insufficiently short time in the acid bath. We have also at times noticed the tendency to considerable loss of depth in such prints if they are kept some time after exposure, and before toning, fixing, &c.

D. L. S.—Unless a very unsuitable lens be used there will be no such distortion in a card picture as can alter the relative height of persons; that is purely a question of scale, and of position in the picture. 2. In either the Wothlytype process or our own process it is possible to obtain more detail and transparency than plain paper prints possess, with less gloss than albumenized paper possesses; and with either of these processes you may obtain good prints. It is a question for your own choice which to adopt.

F. S. A copyright engraving published twenty-one years ago still retains its copyright. Engravings, from old masters, now in course of publication in a serial work may or may not be copyright; it is possible that they are copies of old non-copyright paintings; but that we cannot tell. Those from modern masters are doubtless copyright.

C. M. Major.—The process as now practised in the plates prepared for sale, has, we believe, undergone many modifications since anything was published concerning the details. You will find a brief, but sufficiently clear description of it in Mr. Hughes' manual of photography. The process will answer for transparencies, but the tannin process would probably give good results more easily. There is a similarity between the two methods to which you refer, and probably one has been the basis of the other. In both Mr. Sutton's modification of the tannin process with alkaline development is given.

Photo Juvenis.—The defect you describe generally arises from excess of iodide in the bath. Read the article by Dr. Vogel on the mode of dealing with the case, on p. 570 of our last volume, or the abstract of it in our Year-Book.

W. S.—The lens to which you refer is the very best for your purpose.

A. Z.—With an under-developed negative, intensifying it before fixing, will to some extent continue the development; but care must be taken not to intensify too much, or hardness will be the result. The effect of intensifying with an over-developed negative depends somewhat on circumstances. If you mean by over-development, the continuation of the action of the iron solution until, a deposit is formed on the shadows, then it is important that intensifying be carefully managed so as to prevent further deposit on the shadows. Such a negative is best intensified after fixing. The defect you describe in your prints suggests that the negatives are under-exposed and over-intensified. 2. The appearance of the film on leaving the nitrate bath, much depends on the quality of the collodion. From the description of yours it is probable that the addition of a bromide, or of a sample of collodion containing more bromide would be an improvement to your negatives.

M. McIntyre.—If a lens were required wholly for landscapes we should use a single lens, but where it is required for architecture as well, we should select the triple, as thus more justice will be done to the buildings, and the landscapes will not suffer.

A. A.—We are obliged by your communication and specimens. We shall have something to say on the subject in our next, and will then return the specimens.

Ignoramus.—The method of backing glass positives by covering only the figure with black varnish, and then placing white paper behind the remainder used to be very common amongst cheap portraitists. It is not patented or protected in any way, so that you are quite at liberty to practise it if it please your taste. The effect is, in our estimation, very poor and inartistic.

A. B.—The optical centre in an ordinary landscape lens is about one-third from the back surface.

H. B., Kensington.—The tone of the specimen you forward is most probably produced by means of an acetate bath, the toning not being carried very far. The quality of negative also of course influences the kind of tone in the print.

M. G.—We have no further information on the preservation frames than we published. 2. You have but two alternatives in sunny weather; either to expose your printing frame to direct sunlight, and be content with sun printing; or to protect them from the direct sunshine and be content with diffused light.

R. D. B.—Your plan appears good, but we should prefer 26 feet, at least in length, to 24 feet. If you have an open space of light to the north you will, we think, have light enough. A north side-light is the most desirable arrangement you can have. The only suggestion we can make is as to the propriety of having some light in roof and side at the south, which, in bright weather, might be kept excluded, and in dull weather would at times be useful. Your letter was mislaid last week.

O. K. Walker and several correspondents in our next.

Mr. Trubner wishes us to state that he is agent for Dr. Vogel's silver testing apparatus, described in a recent number, and that he supplies Dr. Jacobsen's aniline colours.

Several articles and Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Alexander Paton, 14, Wardrop Street, Paisley,
Three Photographs of Rev. W. Fraser.
Mr. Francis Dufty, 28, Broad Street, Bath,
Photograph of the Countess of Huntingdon's Chapel and House, Bath.
Davis and Baker, Clonmel,
Four Photographs of P. E. Gill, Esq., of Nenagh.
Mr. W. Guthie, Inn Street, Newcastle,
Photograph of Mrs. Henry Davis.
Photograph of Miss Emily Cross.
Photograph of Miss Eliza Thome.
Photograph of Mr. Frederick W. Irish.
Photograph of Miss E. Cross.
Photograph of Miss E. Thome.
Photograph of Miss E. Cross.
Photograph of Mr. Frederick W. Irish

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THE PHOTOGRAPHIC NEWS.

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ON A NEW METHOD OF PRINTING, AND THE PREPARATION AND USE OF COLLODIO-CHLORIDE OF SILVER.*

BY G. WHARTON SIMPSON.

In introducing a new method of printing, I do not feel it necessary to depreciate or underrate the system already in use. The process of printing on albumenized paper now universally practised, is, notwithstanding its theoretical imperfections, and its occasional practical difficulties, capable of producing prints of exceeding beauty, and I believe that when worked throughout with proper care, the results possess very great, if not absolute permanency. Thanks to the united labour and published experiences of many able practical men, the conditions of success are now tolerably well understood, and with good negatives and ordinary care, excellent prints may be produced with tolerable certainty.

But, notwithstanding, the excellence which has, by long years of practice, been attained in the system of printing with albumenized paper, it has certain admitted defects which photographers would willingly get rid of. The fact that after the most careful fixing and washing, silver is still found in the whites of the finished print, that, in fact, albumen forms a compound with silver which none of our recognized fixing agents can entirely dissolve or remove, and that such compound is in some degree sensitive to light, is in itself a grave cause for distrusting the possibility of absolute permanency in prints produced on albumenized paper. Then the principle upon which the usual method of printing is based, of necessity involves perpetually changing conditions, and consequent uncertainty in the practice of the process,—an uncertainty which can only be overcome by the careful exercise of judgment by experienced and skilful printers. We have to commence with a sheet of paper, impregnated with an uncertain quantity of a soluble chloride, and of an organic substance capable of combining with silver. This is floated on a solution of nitrate of silver, which, after the first sheet is floated, contains an uncertain quantity of the silver salt, plus an uncertain quantity of other matter. Every sheet which is floated changes the condition of the solution, and it is only, as I have said, by observation and experience that anything like uniformity can be obtained.

In the method I am about to describe, in which the sensitive salts are all combined in one inert vehicle, no such changing conditions exist; every specific portion of the vehicle used contains a definite proportion of the salts, and the stock from which it is used is not impoverished or changed in any respect. There is no interchange of parts going forward at each step of the process. The last sheet coated from a bottle of the preparation contains on its surface the sensitive salts mixed in the same proportions as the first. There is nothing, therfore, to prevent absolute uniformity of result.

The process I propose consists in the use of chloride of silver in collodion. Chloride of silver is not, of course, soluble in alcohol or ether, nevertheless, it may be held in suspension in collodion. As this fact, although analogous to other known facts, is, I believe, a new one, which had not before been ascertained, it may be interesting to explain in two or three words the origin of the experiment, which led to this discovery. Whilst attending the meeting of the British Association in Bath last September, in a conversation with Professor Roscoe on the subject of the photometrical experiments he had described in a paper, I mentioned to him my conviction that any measurement of actinism based on the use of paper prepared with a chloride, and then floated on a solution of nitrate of silver must be characterized by more or less of uncertainty, owing in the first place to the varying proportion and character of the organic matter in the paper, and to the varying strength of the nitrate bath if two sheets were floated in succession. Professor Roscoe explained that this would probably be true in printing to the depth necessary for photographic pictures, but in the lighter tints necessary for his photometric experiments, this difficulty had not, after careful observation, been practically felt. Still the conviction remained in my mind that if pure chloride of silver, or this salt plus a definite proportion of nitrate of silver, could be used in some inert vehicle, and spread on glass that more satisfactory and uniformly trustworthy results might be obtained. Almost immediately after my return to London with this thought dominant in my mind, I was invited by Col. Stuart Wortley to witness the manipulation of the Wothlytype process, on seeing which the thought at once occurred to me that chloride of silver might be used in collodion. I knew the tendency of viscous solutions to hold in suspension precipitates formed therein by double decomposition. I accordingly dissolved nitrate of silver in collodion and then added to it a few drops of solution of chloride of sodium. The result was the formation of something like an emulsion of chloride of silver in collodion. This, although something like opal glass, white by reflected light, and perfectly translucent by transmitted light, free from any appearance of turbidity, I expected would eventually precipitate, probably remaining in solution only a few hours, or at most a few days. To my great gratification, however, I found no tendency to precipitate at all, and have not in the samples prepared five months ago. My first experiment with a film of this collodion poured on paper yielded a soft grey image without vigour. On adding more nitrate of silver, vigour was easily obtained, and I have since been able to obtain every variety of condition in prints from the same negative, varying from extreme softness to extreme vigour.

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* Read at a meeting of the Photographic Society, March 14th.

I will now proceed to state a few broad details of the process, premising that whilst I have met with considerable success in my experiments up to the present time there is necessarily in any new process much to learn, which can only be satisfactorily settled by the united labours of many experimentalists. I shall, therefore, in the details I shall give to-night, content myself with describing the mode in which I have produced the specimens I shall place before you, without entering into the modifications and possible improvements of which the process is capable.

The Collodion.—To obtain the best results, the character of the plain collodion is important. The film should not be too horny, as besides giving a degree of gloss offensive to some tastes, it is at times inclined to blister, and leave the paper. It should not possess too much of the powdery character, as in that case it is apt to dry flat and dead, although such a collodion generally adheres well to the paper. Above all it must dry perfectly transparent, without the slightest opalescence or opacity. If the film be in any degree opaque, the print will lose in brilliancy, and will, on drying, appear to have a slight film or bloom upon it. Before using any collodion for printing purposes, I pour a drop on a plate of glass and allow it to dry. If, when dry, it be perfectly transparent, so that it is not easy to discover it on the glass, it will answer admirably. If it dry at all opaque or opalescent, I reject it at once. The soluble cotton most suitable for the purpose, is really that best suited for giving a good negative collodion. I have not had time to institute a series of experiments, for the purpose of deciding the best formula for preparing the cotton, but I have used several samples. The three of which I can speak as answering best, are some prepared by myself for negative purposes some time ago, some I obtained from Mr. Blanchard, and some prepared by Mr. Rouch, by, I believe, Hardwich's formula. That prepared by myself, was made with mixed acids, equal parts of nitric acid, at a specific gravity of 1·420, and of sulphuric acid at 1·840, the cotton immersed at a temperature of about 150° Fah. and allowed to remain ten minutes. Such a cotton is very soluble, and yields a transparent film neither powdery nor horny, which answers admirably. The solvents I have used consist generally of equal parts of methylated spirit and methylated ether. The proportion of cotton depends much upon its quality; of some samples I find that six grains to the ounce, give a collodion quite as thick as can be well managed, whilst with other samples, I can use ten or twelve grains to the ounce with advantage.

It may be found desirable with some samples of collodion, to make some addition to increase its adherence to the paper. An able experimentalist, known to readers of this journal as "A Photographer's Assistant", has found great advantage from some such additions, several of which he has tried, and found sugar the best, both in physical and chemical action. It is not, however, necessary to enter into that subject here.

The Sensitive Salts.—I have tried various proportions of the sensitive salts, and have, on some occasions, obtained good pictures with as small a proportion as half a grain of chloride of calcium and two grains of nitrate of silver. The proportions will necessarily vary with the quality of the negative and the character of the results desired; but with an ordinary good negative I have found that about one grain and a half of chloride of calcium and seven grains and a half of nitrate of silver in each ounce of collodion has given the best results as regards sensitiveness, delicacy, and vigour. With a less proportion of nitrate of silver, greater softness and less vigour are obtained. With a larger proportion of both salts, the paper is a little more sensitive; but no other advantage is gained. I have found here, as I have found before with the nitrate of silver bath, that assuming a chloride is used one grain of which will require three grains of nitrate of silver to decompose it and form chloride of silver, then for each grain of such chloride five grains of nitrate of silver should be added to the collodion to produce the best result.

Various of the chlorides are soluble in alcohol, and therefore available for the purpose. I have not found, as yet, any difference in the result from the employment of different chlorides, except so far as some of them affect the physical character of the collodion, causing glutinosity. I have used, in my experiments, chiefly the chlorides of calcium and strontium.

There are various modes of dissolving the sensitive salts in collodion, but I have found the following the most convenient:—In each ounce of methylated spirit I find I can dissolve conveniently sixteen grains of nitrate of silver by triturating the salt in a mortar, then adding the spirit a little at a time and pouring it off until all is dissolved. I keep a stock bottle of this alcoholic solution of nitrate of silver. To an ounce of this I add an ounce of ether and the necessary proportion of soluble cotton; and then add of a solution of the chloride in alcohol, containing sixteen grains to the ounce, three-fourths of a drachm, containing one grain and a half. This is added, a few drops at a time, the collodion being shaken between each addition. In a few minutes the decomposition is complete, and something like an emulsion of chloride of silver is formed, with excess of about three grains of nitrate of silver in each ounce. This is immediately ready for use, and, so far as a few months' experience is suggestive, will keep indefinitely.

The Paper.—An absolute decision as to the most suitable paper will require a much wider experience than I have as yet had. I have tried various samples both with and without previous preparation. I have used Whatman's drawing paper, Turner's Calotype paper, Bristol-board, common writing paper, ordinary *Saxe* and *Rive* paper, and the paper prepared with arrowroot for the Wothlytype process by Mr. Sanford, and by the United Association of Photography. I have obtained some good results with all; but on the whole I decidedly like the last mentioned best. The chief disadvantage that I found in using unprepared paper has only been found with certain samples of collodion, and has consisted in imperfect adhesion of the film, giving the surface of finished prints a mottled effect. It is possible that some addition to the collodion may be found a remedy for this.

Toning, Fixing, &c.—The paper having been coated, dried and exposed, the toning and fixing may be effected in the usual manner; with this difference, that a very much smaller proportion of the silver salts being present, a much weaker fixing solution may be used with advantage. The prints I exhibit tonight have been treated in various ways, and many of them have been toned and fixed in the mixed bath of chloride of gold and sulphocyanide of ammonium, which I first recommended for uranium prints. Others in the acetate bath, others in the lime bath, others with *sel d'or*, and some have been fixed with hyposulphite of soda, and some with sulphocyanide of ammonium. As you will perceive, every variety of tone is possible, from a warm sepia tint to deep black.

I will now add one or two words on certain characteristics of the prints and the process, in which they vary from others.

The image in most cases appears to be entirely in the collodion film, and not in the paper at all. In some cases where I have removed the film, there have been no traces of an image underneath; and in other cases, on removing the collodion film, a very faint image only has been found on the paper, not nearly equal in depth to that found on removing the film of albumen from an albumenized paper print.

There is no insoluble silver compound formed like that formed with albumen. A properly fixed and washed print by this process when tested with hydrosulphate of ammonia gives no indication of the presence of silver in the whites as an albumenized print does. There is, therefore, good reason to believe in the permanency of these prints.

The paper prepared with collodio-chloride is the most sensitive I have used.

The manipulations are very simple, and the materials always ready without any preparation. Should it be found on experience that collodion is not desirable in printing on a commercial scale, this is at least a process which will be found useful to amateurs, and for many incidental purposes unnecessary to detail here.

The question of relative expense is one unnecessary to discuss now, but so far as I am able at present to calculate, this is, from the economy of silver, the cheapest method of printing I know.

I do not here enter into its various applications besides that of producing prints on paper, but I may mention that I have found it excellent for producing prints on painters' canvas, on opal glass, &c. The specimens I exhibit have been produced under the difficulties of very dull weather, and with the limited attention my own more immediate duties have permitted me to give to lengthened experiments. I have been anxious to try the process on various classes of negatives, and besides the prints from negatives of my own, there are some from negatives by Mr. H. P. Robinson, Mr. Blanchard, and Mr. Cooper, to whom I am indebted for their loan. Some of the specimens, and they are very fine ones, are by a gentleman to whom I have referred—the "Photographer's Assistant," whose detailed experiences will be found published elsewhere.

AMMONIA FUMES IN PRINTING.

BY CHARLES WALDACK.

[We extract the following interesting remarks from a long letter on miscellaneous photographic topics, just received from Mr. Waldack, in Cincinnati.]

It would be a wonder if a letter was written from America on photographic subjects without that hobby-horse of American photographers being mentioned: I mean fuming, or fumigating as some call it. Whatever be its merits and demerits, it is in general use here. At this time of the year it answers admirably, but during the hot summer months, principally when the atmosphere is moist, the prepared paper discolours in a very short time. Lately, I have been using a mixture of carbonate of ammonia and lime, both pulverized beforehand, and mixed together in the drawer of the fuming box. I am inclined to believe that this will answer better than *ammonia conc* during the summer months, the gases in the box being drier. The receipt for the silver solution most used is something like the following:—

Nitrate of silver	1 ounce
Water	7 ounces
Alcohol	1 ounce

Ammonia conc, a few drops.

The ammonia is added to keep the solution from discolouring. Some use in addition nitrate of soda or nitrate of ammonia. I am at variance with you on the effect of these salts. I tested the matter to *my* satisfaction in the following way:—I cut a quarter sheet out of the middle of a sheet of albumenized paper, I cut it in three, and silvered each piece on a different solution; the first containing nitrate of silver 40 grains to the ounce, and nitrate of soda 60 grains; the second same strength of nitrate of silver and of ammonia; and third nitrate of silver alone.

The paper thus prepared was cut in strips, and a strip of each was laid in close contact under the same negative (a copy from an engraving). The negative was of such a degree of intensity that a good print could be produced of it by a 40-grain solution. The paper prepared with nitrate of silver and of soda printed a little redder, but all three looked alike after toning and fixing. (These operations were, of course, done under equal conditions). I could not detect the least difference in the vigour. Now, if the use of nitrate of soda allows the use of a weaker solution of nitrate of silver, the contrast between whites and blacks should have been stronger on the paper prepared with the silver and soda salts than in the other. These experiments were repeated several times with equal results. I afterwards thought the reddish tinge of the paper prepared with the nitrate of soda bath resulted from the nitrate being faintly acid, but have had no opportunity to find out if it was so or not.

I have had the carbonate of ammonia fuming in operation for three weeks now, and I like it much better than the use of ordinary concentrated ammonia. My fuming box is constructed on the same plan as an iodine box. It is 20 by 26 inches inside measure, and 12 inches deep. The paper is pinned on the cover, the mixture of lime and carbonate of ammonia is in a sheet-iron pan in the bottom: a slide or drawer allows the gas to act on the paper when drawn out, and prevents it from escaping when shut. I use about one pound of hydrated lime, and mix with it every day about a spoonful of pulverized carbonate of ammonia. The lime and carbonate of ammonia might be stirred from the outside to prevent the escape of the gas.

ON THE WOTHLYTYPE PROCESS.

BY H. COOPER, JUN.[*]

I wish, this evening, to direct your attention more particularly to the *toning* of the Wothlytype prints, as that is the part of the process which offers the most interesting subject for research on account of some of the extraordinary and beautiful results produced by it. You must have all noticed in the pictures I have exhibited at some of our past meetings, that there are two distinct tints in them—one being warm and the other cold. As this curious effect has been produced more or less in all the prints I have done with uranium, I was, of course, rather anxious to ascertain the why and the wherefore. At first, it was attributed to the process of printing itself; I mean that it was thought to be due to the use of uranium in the way used in the process, but after a good many experiments, I found that this is not quite correct, as I have produced the same effect with ordinary silver prints on albumenized paper. I am of opinion that it is due to the method of toning adopted, although it is more easily produced with the Wothlytype than with any other process.

The particular action of the sulphocyanide of ammonium has yet to be determined, and will afford a very interesting subject for some of our photographic chemists. That it has some peculiar action upon the toning properties of the gold, I have not the least doubt; for with no other toning bath will a print go through the stages of colour that it does in this. When a simply washed print on albumenized paper or a Wothlytype that has passed through the acid bath, is placed in the sulphocyanide and gold solution, it at once becomes of a bright yellow tint. The colour gradually approaches a brown, then a purple, and it will proceed till the tint is a decided blue. This is only what might be expected; but now the difference occurs which distinguishes the sulphocyanide bath from any other.—The blue tint becomes a purple, and at last will reach a ruby red colour; and in prints that have been toned to this last stage, I have failed to detect any silver whatever; the image appearing to consist entirely of gold. But this does not account for the two colours in the pictures, you may say. If you will refer to the paper I had the pleasure of reading before you in December, you will find that I there noticed the peculiarity in the Wothlytype prints of the half tone being coloured more rapidly than the shadows.—

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[*] Read at a meeting of the London Photographic Society, Tuesday March 14th.

I then, as I have before remarked, attributed it to the process of printing; but since find, that although it is observable in a higher degree with the Wothlytype prints, that the toning bath of sulphocyanide confers this peculiar property upon all prints.—It follows from this that almost any desired effect may be produced.

It seems probable that those prints that have been toned through the blue stage will be found to be the most permanent, as the image contains more gold than it would have done if the print had been removed from the toning bath before it had arrived at the blue tint.

The rapidity with which a print colours depends considerably upon the negative. This is the case, more or less, with all methods of toning, but with the one under consideration, is most observable.

This is proved by the following experiment. A piece of paper was coated with sensitized collodion, divided into four parts, and each one then exposed under a different negative. The four prints were then washed and toned together; and no two of them toned alike. One refused to tone at all for some time, and when at last it did condescend to commence, it did so in a very slow and dignified manner, and proceeded in the same style till finished. Another coloured rapidly, and the two tints were very strongly marked. I have related this experiment to show that when great discrepances are observable in the prints produced, the different class of negative used must be taken into consideration. Sometimes prints have been met with which have either refused to tone at all, or which have only favoured the red tone. They have been coaxed to behave properly by placing them for a few seconds in an ordinary acetate toning bath, and then removing them to the sulphocyanide. Although no appreciable action has taken place in the first bath, it is evident from the increased disposition of the print to tone in the second one, that some difference has been caused by it.

Most likely some catalytic action is set up, which causes the deposition of the gold to proceed rapidly and well. Those who have worked at all at electro-gilding, must have noticed what a difference the most trivial circumstances will make in the character and tint of the reduced metal. I have toned many Wothlytypes in the ordinary acetate bath, and have generally found that they have lost considerably; in fact, as much as ordinary silver prints. In a few cases they have behaved the same as though they had been in the sulphocyanide; not losing at all in depth.

The following is a very good plan to reduce any argento-uranic prints that have been overprinted. After washing, place them in a bath composed of 3 grains bichloride of platinum, and 1 grain of chloride of gold, dissolved in 20 ounces of water and made *very slightly* alkaline. The prints are allowed to remain in this bath until they are right as regards *depth*; they are then rinsed and placed in the toning and fixing bath of sulpho-cyanide and gold, and are removed from it when they have reached the desired tone. Another plan which I have found equally efficacious, is to submit them to a bath composed of bichloride of platinum 4 grains, sulphocyanide of ammonium 2 ounces, and water 20 ounces; until sufficiently reduced, and then tone them as in the first method. By-the-bye there is a capital dodge to remove any traces of the acetic acid from the prints before toning; it consists in placing them for a few minutes in a dish of whiting and water. I have found this plan of great use when I have been desirous of eliminating every trace of acid without rendering the print alkaline.

It is curious how people will sometimes hit upon the same idea almost simultaneously, or how one may sometimes compound a salt or arrange a process which is either patented or a secret of the inventors, without ever having seen or heard anything of it. I have met with an instance of this myself.

I heard that Herr Wothly used in his collodion a compound which he called Härz oël; and I also heard that a "Photo's Assistant," had proposed castor oil, as an addition to the collodion for Mr. Simpson's process. It then occurred to me to make use of this suggestion, and an idea that I had; and try and compound something which should answer as well as Härz oël, the composition of which was a secret, and which, by-the-bye, I had not used or seen. After careful consideration I made two.

The formula for the first was—

Castor oil	2 drachms
Canada balsam	2 ,,

Dissolved in half an ounce of ether.

No. 2.

Castor oil	1 drachm
Canada balsam	2 drachms
Glycerine	2 ,,
Ether	½ ounce.

From five to ten drops of either of these was added to an ounce of sensitized collodion, and great benefit was found from both. I have not yet determined which gives the most satisfactory result, but think that each will suit a different class of collodion. When I received the *British Journal* for February 24, I was surprised to see, at page 97, in the French specification of the Wothlytype process, directions for making the Härz oël, and to find that the composition of it was almost identical with my No. 1. The effect of adding this composition to the collodion has been to render it more sensitive, to cause it to print much more richly and evenly. It also seems greatly to improve the physical properties of the collodion. The toning proceeds more satisfactorily, and the film shows no tendency to leave the paper. I added some to an ounce or two of collodion that was put aside as useless; and, after the addition, obtained very good prints with it. I have got over some very annoying difficulties by using it.

Also with regard to the so-called triple salt, described in the same specification. In January I made several salts for experiment, and among them was one made almost the same as that described.

I had some specimens of these salts with me at the February meeting of the South London; but did not introduce them to the members, as there was plenty of other matter before the meeting.

I have said "so-called *triple salt*," as I think the salt in question is a mere mechanical combination. Although uranium and ammonium may form a double salt, I very much doubt if it be possible to form a double nitrate of silver and uranium, to begin with; and even if this were possible, the nitrates of each metal are not united in their equivalent proportions. Let me be understood; I do not say that the salt in question is not, or may not, be a triple one, but that I doubt for several reasons that it is so. Some time back, I was in hopes that I had succeeded in producing a double nitrate of silver and uranium, as I obtained a salt that was essentially different in appearance to either nitrate of silver or nitrate of uranium.

But after careful consideration and examination of the salt, I came to the conclusion that it was a combination of the nitrates of silver, uranium, soda, and perhaps some other. The source of these latter being the nitrate of uranium, which was not quite pure. I have crystallized together the nitrates of uranium, silver, and ammonium in their equivalent proportions, and I will pass round a sample of the result. I will also place upon the table for examination by those interested, some specimens of salts consisting of the nitrates of silver and uranium; silver and ammonia; and ammonia and uranium.

I do not know that I have anything fresh to say on the manipulation of the Wothlytype, except as regards the drying of the paper. It has been found that rather a high temperature has produced a much more glossy surface than a lower one; but great care must be observed in preventing a change of temperature whilst the paper is drying, and to guard it from draughts.

Should the temperature be changed before it is dry, the result will be that the surface will be mottled in places. Take care, also, that the paper is quite dry before placing it in the pressure frame; if this be not attended to, insensitive spots of a large size will make their appearance. And then, again, the paper must not be too dry.

A very good plan is to collodionize the paper the night before printing upon it.

I have made many experiments to determine the applicability of the Wothlytype process to photographic printing on painter's canvas. I was very hopeful of arriving at a successful result; but regret to say that, up to the present time, my endeavours have not proved satisfactory. When using the process on paper, in most instances, the greater part of the image is on the paper and very little in the collodion. I had hoped it would be the same on the canvas, and was surprised, as well as disappointed, to find very little impression on the canvas, the image being almost entirely retained by the collodion. The objection to the collodion remaining on the canvas, is the danger of its cracking and peeling off in the course of time. Of course this danger is materially lessened by using a very powdery pyroxyline; but still I should like to be on the safe side, and do without the collodion if possible. If the collodion is to remain on the canvas, I think Mr. Simpson's process with chloride of silver in collodion will be the easiest to work. I have met with a difficulty whilst printing on canvas, which I have not been able to overcome. The chemicals and the necessary soaking in water has usually rendered the composition on the silk or canvas quite brittle, so that the least touch will crack it. I must also call your attention to the fact that the canvas will become discoloured in a few hours after its sensitizing, owing, I believe, to lead in its composition. I have not tried printing on either wood or ivory with uranized collodion; but am glad to hear that some other gentlemen have proved it to be practical, and the results very satisfactory.

I am sorry that this paper has not more novelty in it than it has, but the continued experiments upon a process are seldom very new or startling; and although I have made several new ones, the results have not been sufficiently interesting for me to trouble you with the details.

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SOME OF THE DEFECTS IN LANDSCAPE PHOTOGRAPHY.*

BY FRANK HOWARD.

In venturing to call attention to this most important aspect of photography, I am aware that it is a most delicate and difficult task, for, though we have now arrived at a period when the art has, without doubt, achieved most important results, there is very much that still remains unsatisfactory; and, in critically examining these defects, the difficulties of overcoming them in their chemical and manipulatory details will strike us very forcibly.

The early days of violent contrast—black, intense shadows, and white, hard, high lights—are doubtless well remembered, as well as the white patch for a sky. They have been overcome; but the early workers of the collodion process were as apt as we are to think that, without some great and almost impossible discovery, the best was accomplished, and the results then attained were as good as ever would be. Had it not been for some of the most painstaking and persevering pioneers—both chemical and optical—the satisfaction of the rest, and the wonder-stricken applause of the public at the then, to them, marvellous results, would have landed us in the year 1865 not much in advance of 1855. It is by looking back that results are better appreciated, and I hope that another ten years will see as much or more improvement than the last. It is with this encouragement that I venture to approach the subject of "Some of the Defects in Landscape Photography."

Commencing from the point of view from which the public see our efforts, let us enter one of the exhibitions of photography, many of which have been held lately both in the metropolis and in various provincial towns; but, unless we can throw off our *esprit de corps*, and approach the matter to view it from the position I have just named, many of the defects will not strike us. What is the reason that we see so few people here? Well, photography has not the attractions that the exhibitions of oil and water colours have; and, though representations of nature, they have not the life and colour of a painting, and want the atmosphere and warmth.

Agreed. Now let us begin. What says the catalogue about this? Ah! very nice! how very pretty! Why, that's Windsor Castle. Look! here's Lord ——. Very like. How clean and nice this picture is—Shakespeare's house! Look, you can read the printed notice on that fence. And our critic is quite right; all, or nearly all, the pictures do look clean and nice; and sorry should I be if they did not. But have they not many other attractions? Some few have, but for many, too many, that is their only merit. To a photographer, or observant photographic amateur, the productions of many men possess sufficient individuality to identify them wherever they may see them, but to the public one photograph is, I am afraid, very like another. Why is this? It is because little else is aimed at but a clear, sharp, vigorous negative. With the exception of a few instantaneous views that have been produced, few pictures possess any skies, and these, I contend, may justifiably be printed in from another negative, care being taken to exercise a judicious selection, or the negative may, and in almost all cases should, be manipulated upon to produce the effect of atmosphere and distance. Again: what few pictures there are that can be identified with any particular period of the day—morning, noon, or evening. One of the causes of this is the almost invariable habit of placing the camera with the principal source of light directly at the back; and if we recognise this evil in portraiture, and condemn a picture (and justly so) taken with that defect, it is to be condemned, though it is not so decidedly objectionable in landscape. Still, if we continually repeat such pictures, it makes them uncommonly like one another, and the more so from their clean, neat manipulation.

The under-exposed pictures we see occasionally, if with judicious clouds called "evening," are far preferable to the trim, clean, see-if-you-can-find-a-fault-in-me style of thing that is perpetuated so continually. Again: and here the liberties artists take with nature may be very apparent, and may be used by some as an argument in favour of the tame, insipid character of their photographs, when they say it is just as the objects are in nature. There is no tree in that corner, and there was no individual fishing so calmly when I took my view as our friend the painter has inserted in this picture. True; I have no doubt about what you say; but before the painter commenced his picture he studied the best point of sight, and took some time in discovering it. But you took your photograph, packed up your apparatus, and was away in a quarter of an hour; hence you have not got the best view, and though it may be so beautifully sharp, clean, and well exposed, the photograph is still uncommonly like that taken last year by Smith, or the year before by Brown. In the new form of picture—those about 7 × 4—a great stride was made in doing away with the conventional square-shaped pictures which helped to make photographs so much alike.

With regard to names and descriptions of pictures, how few photographers study that very important matter, so full of feeling and expression, as a judicious name to a photograph. How suggestive to study the picture to see if it really is like nature, and what it purports to represent. With three or four exceptions, photographers name their pictures with as little enthusiasm as is conveyed in the information that this is a chair, and that is a church. The very fact of thinking for names and subjects will make a judicious selection almost certain, and a picture without meaning a rarity.

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* Read at a meeting of the South London Photographic Society, March 9, 1865.

We shall, I hope, with the improved apparatus, chemicals, and the increasing knowledge of the capabilities of our art, which it is our good fortune to possess, make more rapid strides than before; and now that we know our ability to render photographically much that we were prevented from till very recently even thinking about, I trust that landscape photography will receive such care and attention from those whose love of nature, or their profession, causes them to take their cameras into the field, that it will take that prominent position in the admiration of the public its manifold beauties qualify it to occupy.

With amateurs particularly, I hope that, instead of photographing everything that they come across, without thinking about effect or artistic results, they will, by careful study and selection of judicious views, keep pace with those advanced professionals who are setting us such a good example.

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PRINTING ON OPAL GLASS.

BY PROFESSOR TOWLER.*

The easiest method of producing opal or porcelain pictures is the following:—

Prepare in the first place a copying camera. A globe lens, an orthoscopic lens, or, in fact, any good portrait or view, combination may be used advantageously for this purpose. We will suppose you wish to copy from the smallest size in ordinary use to the four-fourth size; therefore, let your copying box be ten inches square in the transverse section (inside mesurement.) Cut out two pieces of well-dried half-inch stuff (mahogany, cedar or pine) ten inches square, fix one of them accurutely perpendicular over the other, right in the middle from side to side; so combined, they will, when viewed sidewise, look like an inverted T, that is thus, ⊥. This middle piece, as we said, must be *perpendicular;* be careful about this point; and not only perpendicular, but fixed permanently by means of triangular abutments on either side, so that it cannot be deranged out of the perpendicular position.

In the middle of the perpendicular piece the lens is adjusted. If a pair of lenses are to be used for stereoscopic operations, they are adjusted on a line parallel with the base and passing through the centre of the perpendicular piece. So fixed the lens can be shoved on its base backwards and forwards as required.

Suppose the focal length or burning point distance of the lens or lenses be ten inches; then, in this case, construct a long cylinder ten inches square. (inside mesurement) and forty inches long or more. The middle part of one side is mounted on hinges, and can be opened as a door, which may be twenty inches in length. Open this door and insert the lens in its place in the middle of the cylinder; it is evident the lens will move backwards and forwards in this cylinder, if the mesurements have been accurately adhered to. At one end there is a similar T shaped arrangement for sliding and for holding the negative. The negative is placed in a cavity in the centre of the perpendicular piece and held there by means of springs, tacks or pins. As a matter of convenience the negative is turned upside down and the collodion film looks outwards. This film with the lens in question must be twenty inches from the optical centre of the lens; and with every other lens, the distance of the film from the centre of the lens must be twice the burning distance of said lens. At the other end of the cylinder an arrangement is made to receive the plate-holder containing the senzitized plate, which is fixed in focus in the usual way. We will now suppose the following conditions to exist:—

1st. The picture on the ground glass is sharp, that is, accurately in focus.

2nd. The height and breadth of the picture are exactly the same as those in the negative.

3rd. The centre of the picture is equally distant from the base and either side, as the centre of the negative from the base and either side.

This being the case, we shall find that the distance of the negative film from the film on the sensitive plate will be four times the length of the burning distance, and the centre of the lens will be exactly half way between these two films, and at an equal height above the base.

These are the conditions required.

A magnifying glass is necessary in order to obtain an accurate focus. You cannot dispense with it; therefore, be obedient and get one at once.

If you receive your light from the skylight, an adjustment of the following nature is very expedient.

Take a picture-frame ten inches square, and fasten it on hinges on the base board of the negative slid-holder in such a way as to be fixed at any angle between zero and ninety degrees. An angle of forty-five degrees will be most generally required.

Taking the thin board from the back of the frame, clean the glass thoroughly, and, when replaced, pour upon it, as it now lies, a layer of plaster of Paris made into a cream for moulding; the layer may be of any convenient thickness from one-eighth of an inch upwards. As soon as it is thoroughly dried, fix the thin back board in its place, which will prevent the layer of plaster from falling out.

This layer is perfectly white, and reflects white light.

When the frame is fixed at an angle of forty-five degrees, light from the skylight will pass horizontally through the negative, and this illuminates it with a vivid white light as from a white cloud.

With such an arrangement copying is an agreeable pastime.

Now we come to the opal or porcelain glass.

Let the opal glass be carefully washed and polished. It is then coated with collodion and sensitized in the negative bath like any ordinary piece of glass, and finally placed in the plate-holder.

The exposure naturally varies with the focal power of the lens and the quality of the light. The time required is that which is required for a negative, although the production which you aim to make is a positive; but this positive is a transparent positive, and is very different from an ambrotype. With a lens of three inches focal length, in winter as now, and the light received from the skylight as described, about three minutes, exposure will be nearly right.

The same judgment as to the proper time of exposure is valid here as with the negative—there is not the slightest difference, and the same may be said in reference to the developing, understanding well, however, that not the slightest trace of fogging is admissible in the opal picture. If fogging supervenes before the shades are sufficiently intense, either the time of exposure has been too long, or the developer too energetic, in which case your judgment will have to be guided by your previous experience.

After developing, fixing, and intensifying, the tone is of a greyish brown, and is not sufficiently pleasing for a positive; therfore submit the plate to the final operation.

The tone may be changed from the grey-brown to a blue-black or a brown-black by the following methods:—

First Method.—Take a neutral or slightly alkaline solution of chloride of gold (one grain to the ounce of water), and add one drop of this solution to each drachm of water required to flow the plate. Pour this solution backwards and forwards over the film; its tone will quickly change to the hue desired. Then wash thoroughly.

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* Continued from *Humphrey's Journal.*

Second Method.—Two drops of a saturated solution of bichloride of mercury and half a drop of a solution of bichloride of platinum in alcohol (one grain to the ounce) to each drachm of water, when flowed over the film, will produce about the same effect as the gold solution. By this method, however, the film is apt to be loosened from the glass.

Third Method.—Dissolve one grain of sel d'or (hyposulphite of soda and chloride of gold) in one ounce of water, and of this solution take one drop to each drachm of water, and pour it over the plate. This will soon change the tone to your liking. These methods are sufficient, although many others might be quoted.

When the picture is satisfactory, fix and wash as usual, then dry and varnish. Transparent and colourless varnish is the best for this sort of picture, in order to avoid stains, spots, and dicolouration.

Cases may be had for mounting porcelain pictures; they resemble ambrotype cases, excepting that the back takes out and an oval opening is left. A thin piece of coloured glass, of a violet, rose-colour, or indeed any other colour, is mounted with the opal picture and behind it in a matt; and where the picture is not varnished, another thin piece of clear glass takes its place in the matt and over the picture. So mounted in a case the opal picture produces a very pleasing result.

The negatives used in this sort of printing are taken in general from engravings or other works of art. Vignette printing by the conjugate camera is easy and pleasing. An oval opening is arranged either between the negative and the lens, or between the lens and the ground glass. It is a matter of no consequence which of these two places is selected for the position of the vignette opening. Positives made in this way are adapted for lantern shades and such like; they may be fixed, too, by glazing in windows, where translucency but not transparency is required.

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IRON DEVELOPERS.

Preparation of the Proto-acetate and the Proto-nitrate of Iron from Carbonate of Iron, for the Development of Photographic Negatives.

BY M. MC. A. GAUDIN.

I have made very numerous researches to arrive at the substitution of the proto-acetate and the proto-nitrate of iron for the proto-sulphate of iron and pyrogallic acid for the development of negatives, and I have frequently obtained negatives quite comparable to those given by pyrogallic acid with positives white as snow. I have constantly remarked that negatives by the proto-acetate were yellowish in tone, and those by the proto-nitrate of a fine white: the first being very clear and sharp, while the latter were a little granular, that is to say, crystalline.

I prepared these salts by making the acids act directly upon the iron, and also by double decomposition. Of these two processes the first is long, and the second gives weak products, which, consequently, decompose very quickly. I finally came to the conclusion that the best method consists in preparing these salts by the action of acids upon the artificial carbonate of iron.

Since the date of these researches, which is now very remote, I have adopted the method generally pursued, which consists in first developing with proto-sulphate of iron, then strengthening more or less with pyrogallic acid.

Sulphate of iron, in fact, never gives a maximum effect exceeding a grey by reflected light, and by transparency an opacity, which is far from yielding perfect whites in the printing. If, for example, we take a landscape, the sky is never opaque enough to yield a pure and homogeneous white in the printing, which necessitates the covering of the sky with a coating impervious to the actinic rays; in a word, the employment of this salt alone does not yield a good effect except in the half-tones, and the picture never exhibits its real value in the high lights. In preparing these two new salts of iron in large quantity, we may procure a good supply in a concentrated state, which may be afterwards diluted to the proper strength for daily consumption. The carbonate of iron is prepared by mixing together protosulphate of iron and carbonate of soda, in equivalent proportions; that is to say, by dissolving nearly equal quantities of each salt, because their equivalents are nearly of the same weight.

$$NO, CO^2 + 10\ HO^2 \text{ and } FO, SO^3 + 7\ H^2O.$$

To facilitate their solution, it will be well to pulverise them and use hot water. Upon being mixed, a grey precipitate will be formed, which is washed with several waters, the precipitate being left after each washing to settle at the bottom of the vessel, and at the last thrown in the state of mud upon a filter. To form the acetate or nitrate it now only remains to pour some concentrated acetic acid upon the precipitate, or nitric acid diluted with double its volume of water, taking care that a little carbonate always remains in excess, and facilitating the reaction by a gentle heat. As soon as the effervescence has ceased, the salts will be formed, and it will only be necessary to filter the liquors to obtain a good stock.

To make these solutions work well, they must be diluted with water, slightly acidulated with sulphuric acid, and stirred for a few moments. The solution of proto-acetate of iron will be the colour of old pale brandy, and that of the proto-nitrate of a light greenish yellow.

The property of these reducing agents consists in causing the picture to appear little by little, and gradually give the greatest intensity to the blacks of the skies, for example, with very fine transparent reddish hues in the half tones. After washing in abundance of water, these salts, with the addition of a small quantity of 3 per cent. solution of nitrate of silver, will strengthen the negative; the nitrate of iron especially, which will strengthen even after the picture is fixed with hyposulphite, provided the washing after fixing has been as perfect as possible.

Sometimes the action is very slow, as slow as the development of albumen with gallo-nitrate, but then the picture is exceedingly delicate and beautifully modelled.

By proceeding in this manner, the stock of developing solution being kept well corked, will keep good for an indefinite time, and even improve with age, because it will undergo a transformation the nature of which at present remains unknown, but which may be represented by a salt intermediate between the real protosalts, which reduce too much, and the per-salts, which do not reduce at all, but, on the contrary, cause the picture to disappear very quickly.—*La Lumière.*

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Proceedings of Societies.

London Photographic Society.

The usual monthly meeting was held at King's College on the evening of Tuesday, the 14th instant. Mr. J. Glaisher, F.R.S., &c., in the chair.

The minute of a preceding meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Mr. T. Sopwith, Viscount Hawarden, and Mr. G. Dawson.

Mr. H. Cooper then read a paper on "The Wothlytype Process," (see p. 123), in the course of which he exhibited a variety of those charming prints, illustrating skilful and effective double printing, as well as good specimens of the uranium process, with which his name has become identified. He also exhibited some fine specimens of printing on albumenized paper, illustrating the peculiar action of the mixed toning and fixing bath of chloride of gold and sulphocyanide of ammonium, proposed originally for the Wothlytype prints by Mr. Simpson. The prints having been examined with much interest.

The Chairman proposed that as the next paper was also on printing, the discussion should be taken on the two papers at once.

Mr. G. Wharton Simpson then read a paper "On a New Method of Printing, and the Preparation and use of Collodio-chloride of Silver" (see p. 121). In the course of the paper he exhibited a bottle of the collodio-chloride of silver, and in answer to the chairman's expression of surprise, and enquiry as to how long it had continued without precipitation, stated that he had still in his possession a sample which remained free from precipitation at the end of upwards of five months.

At the conclusion of the paper, Mr. Simpson exhibited about fifty specimens, including card and whole plate portraits, and landscapes of various sizes, with a great variety of warm tones of the sepia and bistre tints, and various purple and black tints. There were examples also of many gradations of vigour from extreme softness to great brilliancy. The prints were examined with much interest and elicited many expressions of admiration from the members.

The Chairman said, it was a remarkable and gratifying circumstance that the Society was favoured on the same evening with two papers bearing so closely upon each other. The beautiful tints in the pictures exhibited by Mr. Cooper increased the interest the members must feel in this process, and he should be happy if anyone who had any experience in the subject would give them the benefit of his observations thereon.

Mr. H. P. Robinson said he had had opportunities of seeing a good deal of printing carried on by Mr. Simpson's process. What struck him as one of its special advantages was, that good results could be produced from almost any class of negative. He had seen brilliant and vigorous prints taken from negatives so weak and thin that he should have considered them worthless for ordinary silver printing; and he had seen soft and delicate results from what many printers would consider hard, over-developed negatives. And this, he thought, was its great advantage over the Wothlytype process, which, he believed, required a considerable amount of density in the negative. There was another thing worth the attention of photographers. The germs of many good processes had been suggested, but these germs being nipped in the bud by patents, have never had the chance of coming to full maturity, the public generally having no great interest in improving the property of an individual. The *Simpsontype*, he was happy to find, was given freely to photographers, without any reservation whatever. So that whatever they could make of it by experiment belongs to themselves as common property. The credit of the discovery, and the thanks of photographers belongs to the inventor—the profit to the public.

Mr. Simpson, in reply to Mr. J. Williams, said he had used alcoholic solutions throughout. He had on one or two occasions, when he had found it desirable to add more silver to the portion already made, used a very concentrated solution of nitrate of silver, which enabled him to add sufficient without much altering its physical condition.

Mr. Cooper said he had, within the last month or two, been making many experiments with this process of Mr. Simpson's, and at the first he got very much better results than more recently. The difficulty he had experienced was the blistering of the collodion-film, and also a slight want of transparency in the shadows, when the tints were dry. By examining one of the prints produced with a horny collodion, it would be found that, on holding it so as to catch the light at an angle, the whole of the surface was dimmed, and the shadows had a cold blue over them, whilst another, from a powdery collodion, was quite transparent. He had, however, no doubt that when the process came to be worked out a little more, and the minor details improved, it would prove a great boon to all amateurs. There were slight objections to it on a large scale; but if a few little manipulating difficulties could be got over, it would be just the thing for those who had only to produce a small number of pictures. Another advantage it possessed was, that it produced no dirt on the fingers or clothes, which it was almost impossible to avoid in the ordinary printing process.

Mr. Mayall asked Mr. Simpson whether he had tried the experiment of giving his process a dose of castor oil. He also wished to know whether he had tried sulphide of potassium before fixing. He was happy to bear his testimony to the value of the new process which had been presented to the Society; and he felt it due to Mr. Simpson to say, that by whatever process the print he held in his hand had been produced, it possessed a degree of excellence in the shape of positive printing which he had never seen before, more resembling a fine engraving by Cousens than an ordinary photograph. Of course, with reference to a subject so new, and coming upon them as this did for the first time, they were not able to discriminate its peculiarities so materially as they would be in a position to do after a few days, when it had been more carefully considered. On the subject of the Wothlytype he would observe, that those who had tried the experiments with it must be fully aware of the great amount of uncertainty which had existed to the present time in producing uniform results. By Mr. Simpson's, the film of the collodion being much finer than any kind of paper, and the image being in the film, a great amount of middle tint and detail in the printing could be obtained; because the film itself had a certain amount of thickness, and through the whole of that thickness the action of the light would take place. Looking at the subject casually, he should be inclined to think that the extension of the fixing-power would be very materially increased, that is, that a considerably longer time might be allowed in the process of fixing without impoverishing the print. He suggested that trial should be made with a weak solution of cyanide to finish off the negative. He had no doubt that this process would bear fixing with a weak cyanide of potassium after it had passed through the sulphocyanide, and, if so, they would arrive at greater brilliancy. This subject, he was sure, would at once receive from the photographic public, not only in this country, but also in France (where all questions of this kind were taken up so vigorously), an immense amount of attention. And he had no hesitation in saying, from the specimens now exhibited, that the Society had to congratulate Mr. Simpson, who had shed an honour upon the meeting by bringing forward in so disinterested a manner a process so new and interesting, involving, as it did, so many fresh chemical enquiries, which were as yet but imperfectly understood. He ventured also to suggest that, in any experiments which might be conducted, a variety of highly complex oils, rich in hydrogen, should be tried, as the kind of substances more likely than any others to add brilliancy, certainty, vigour, and roughness, to the film of collodion. No doubt by applying to some of the photographic chemists, they would be able to recommend a series of substances highly valuable for the purpose. He thought that, as a number of chlorides could be impregnated with the collodion, it was most essential that the whole range should be gone through,—not only the earthy salts of the chlorides, but the whole of the metallic series. He had been much struck, while the paper was being read, with the fact of the small amount of silver used—about seven grains per ounce. If the result of experience should be that greater perfection of result by this process was obtained, there was no question as to its being employed commercially.

Mr. Sebastian Davis said, he believed the process would commend itself to experimentalists, inasmuch as they themselves could prepare their own paper throughout, and would be thoroughly conversant with all the materials used during the preparation of their positive prints. This was a point of great interest to every one, because in this way they could trace out the particular difficulty which might interfere with obtaining uniformity of tone, density, and permanency. In his own experiments he had departed a little from the formula of Mr. Simpson, and had, consequently, obtained a varied result.

Mr. Williams said the real use of castor oil was to make the collodion tenacious, and prevent it shrivelling. He wished to know whether the white, milky collodion, a specimen of which was exhibited by Mr. Simpson, would blacken when exposed to light, or would remain permanent as it now appeared.

Mr. Simpson said he had not exposed it to light, conceiving that the effect would be that it would blacken.

Mr. Cooper said he knew that it did blacken, from the fact of some in his possession having become exposed.

Mr. Simpson, in reply to an inquiry, said he thought the sooner the paper was used, after being prepared, the better; but he had used some after the lapse of a week, which had not lost its sensitiveness. In reply to a further inquiry, he said it was difficult to state, in figures, how sensitive it was; but his impression was, that it printed in one-half the time that albumenized paper required for the purpose.

Mr. Cooper asked whether the prints did not lose more in tone and tint than those of albumenized paper.

Mr. Simpson said, he found they required almost entirely the same treatment in toning and fixing.

Mr. COOPER said, in his own experiments he found that the more he increased the quantity of chloride in the collodion, the more they lost in tone.

Mr. H. P. ROBINSON said that in the observations on the process he had made, he thought the prints lost less than albumenized paper.

Mr. MAYALL said, that losss would be stopped entirely by the sulphide of potassium. He had found that, if not washed in that salt before they began, they did lose considerably. A very feeble solution of not more than one-tenth of a grain to an ounce of water would enable them to get rid of the difficulty which Mr. Cooper referred to.

Mr. FRANK ELIOT suggested that citrate of silver in the collodion would aid materially in giving vigour if required.

Mr. SIMPSON said, with regard to the use of castor oil, he had made one or two experiments; but he could not say that he had carried them out to any extent. The only difference he found was, that the physical character of the collodion was altered; it was made more tenacious and more adherent. It was quite possible, he considered (but he had not tested it sufficiently to speak definitely on the subject), that it might supply something that formed an organic compound with the silver. Reference had been made to the use of citrate of silver; he had not tried it himself, but he had been in correspondence with some persons who had done so with decided advantage. His special aim hitherto had been to get the best results by the simplest means; and he had striven, therefore, at the obtaining of vigorous prints with the simple collodion, chloride of silver, and nitrate of silver. If these failed he should necessarily apply himself to the use of organic compounds; and it was quite possible that those might be worth experiment. He had not on this occasion brought any specimens which he had obtained by other means, simply because he wished to speak of the process in its broadest and simplest outlines. He had not met with any example like that referred to by Mr. Davis, of the image sinking into the paper. In almost every case the image had been in the film of the collodion; when that film was removed by cracking or otherwise, he had some times found faint traces in the paper of the deepest black of the image, but in other instances no trace whatever. One remarkable fact well worth pondering over was, that he had obtained a good vigorous picture with collodion in which there was only half a grain of soluble chloride and two grains of nitrate of silver in an ounce of collodion; a sheet of paper 22 by 18 might be coated with this quantity, whereas in the ordinary albumenized paper about 50 grains of nitrate was absorbed by each sheet. This was a pregnant suggestion in regard to ordinary printing, as indicating the large amount of silver which ought to be saved.

The CHAIRMAN said, he did not think he ever rose with greater pleasure than he did on the present occasion, to ask the Society to give a vote of thanks to those who had read the papers. When the first Wothlytype was laid on the table, a strong desire was felt to know something more upon the subject, and great disappointment was experienced because there was no discussion. The Society had, however, gained something by the delay. In every respect, both Mr. Cooper and Mr. Simpson had a strong claim upon the meeting for the expression of their cordial thanks, and he had much pleasure in proposing that such a vote be presented to them.

The motion was put, and carried unanimiously.

Mr. COLLIS exhibited Mr. Ross's large-angle doublet, and explained its advantages. It included, with the smallest stop, an angle of over 82°; the smallest drop was equal to 1-40th of its focal length, and the largest about 1-14th. He also exhibited a print from a large triple lens.

Mr. DALLMEYER exhibited some fine photographs, just received from Paris; they were by Messrs. Ferrier and Jeanrenaud. The larger ones were taken with his No. 6 triple lens, the smaller with his No. 4; they were perfect in every detail.

On the table was placed a series of beautiful photographic reproductions of engravings from Turner's pictures of England and Wales; the copies by C. C. and M. E. Bertolacci.

The CHAIRMAN announced that the Committee of the approaching Dublin Exhibition were now advertising for tenders for the exclusive right of photographing the interior of the building; also that the French Photographic Exhibition was to commence on the 1st of May.

The proceedings then terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

ON Friday, the 3rd instant, a Council Meeting of the Amateur Photographic Association was held at 12 York Place, Portman Square. His Grace the ARCHBISHOP OF YORK in the chair. The minutes of the last meeting having been read and confirmed, the following members and subscribers were proposed and elected:—Lilburn Roshor, Esq.; J. W. Richardson, Esq.; Wm. Jones, Esq.; George Ward, Esq.; H. E. Pilleau, Esq.; O' Leary, Esq.; G. H. Graham, Esq.; Capt. Philip Hamond; Mrs. Stone; George Macnair, Esq.; J. Scott, Esq.; Miss E. Filmer.

The subject of the late soiree and visit of the President, His Royal Highness the Prince of Wales, having been introduced, Mr. Glaisher said that as the only member of council then present who received His Royal Highness, he congratulated the Council and the Secretary on the great success which had attended their efforts, and the honour which had been conferred on the Association by the presence of His Royal Highness as President of the Society. Indeed, he felt that it would be a source of gratification to the whole photographic world, that our future sovereign took so lively an interest in our art. The Secretary stated that upon expressing to His Royal Highness how much pleasure and gratification he had conferred upon the members of the Association by his visit, His Royal Highness graciously replied that he (the Secretary) might assure the members *that he had been much pleased and interested by the inspection of their works.*

The SECRETARY, moreover, stated that the soiree was very successful, that nearly four hundred persons had attended, many of whom had come from great distances, in fact, from all parts of the kingdom, to be present on the occasion.

The SECRETARY laid before the meeting letters from the Earl of Caithness; Sir T. M. Wilson; T. T. Briscoe, Esq., M.P.; T. Walter, Esq., M.P.; Ald. Sidney, M.P.; W. Longman, Esq.; and other eminent persons, regretting that circumstances, over which they had no control, prevented their being present at the soiree.

His Grace the ARCHBISHOP OF YORK mentioned how very much he regretted not having been able to attend,—that he would willingly have travelled from York to be present, but that having had to sit that afternoon as President of Convocation at York, he found it absolutely impossible.

Other general business having been arranged, a discussion upon the Rules of the Association, with the view of making them somewhat more rigid, and better adapted to the present state of the Association followed, resulting in referring the matter to Mr. Glaisher to prepare such for submission to the Council at a future meeting. The proceedings then terminated. A. J. MELHUISH, HON. SEC.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on the evening of Thursday, March 9th, in the City of London College, Mr. SEBASTIAN DAVIS in the chair.

The minutes of a preceding meeting having been read and confirmed, Messrs. Russell, Manners, Gordon, A. Booly, and W. Williams, were elected members of the Society.

The CHAIRMAN called attention to various objects of interest which were laid upon the table.

Mr. TAYLOR exhibited some examples of two portraits of the same person on one card picture, by Lewitzky, of Paris, which excited much attention.

Mr. HUGHES also exhibited an example of a similar class of picture by Mr. G. R. Gill (see p. 62 of the present volume.) He (Mr. Hughes) said that although he could understand how two figures were taken by the plan described by Mr. Gill, he was puzzled to understand how, in those of Mr. Lewitzky, not only were the two portraits of the same person taken on one plate, but the one figure was shaking hands with the other figure. He should be glad of any information as to the method employed.

A conversation followed, in which a general conviction was expressed, that a third person had been employed to give the clasped hand, and that a junction had been effected where the hand emerges from the sleeve. It was remarked also that whilst in Lewitzky's picture a background with a design containing many vertical lines was employed, which would aid in concealing a junction, in Mr. Gill's a plain background was used, and still no trace of joining seen. Mr. Robinson stated that Mr. Gill used shutters to suit the shape of the two figures.

Mr. How exhibited a photograph from a drawing illustrating a somewhat singular discovery in medical science. He stated that it had been found that the breath of persons in various states of disease, when received on glass, and examined under a high power with the microscope, was found to assume various definite shapes, chiefly of a crystalline character. Different stages of consumption, for instance, giving uniformly different shapes, the same shapes being given by the breath of all persons in the same stage of the disease. The breath in the cases now illustrated was received on glass with a prepared surface, and then drawn by Mr. Lens Aldous, by the aid of the camera lucida. The various drawings were then arranged and copied by photography, a print of which was on the table.

After some conversation,

Mr. **Wharton Simpson** remarked that the method bore some analogy to the method of testing various bodies by means of what was termed their "cohesion figures," a system devised and very ingeniously carried out by Professor Tomlinson. A drop of any fluid, oil, balsam, spirit, &c., was found, when dropped on the surface of a glass of pure water, at once to spread and form a definitely shaped figure on the surface of the water. The figures consisted of an almost infinite variety of forms, but each substance always gave its distinctive figure, affording unmistakeable evidence of purity or adulteration. It had already been found useful as a substitute for analysis, and had the advantage, not only of greater simplicity, but of dispensing with the destruction of the body to be examined.

Mr. **Hughes** said no doubt the print exhibited by Mr. How was very interesting, and had it been possible to have produced photographs of the alleged breath figures themselves, anything like the beautiful micro-photographs of Dr. Maddox, the evidence would have been very valuable. But when it was necessary to produce the drawings by hand, the valuable internal evidence afforded by photography was lost.

The **Chairman** said he thought that the Society could only take the facts as they were stated, and thanking Mr. How for the sight of the print, leave the scientific question without expressing an opinion, as the subject was indeed scarcely before them.

The **Chairman** called attention to a series of Mr. Blanchard's instantaneous stereographs, exhibited by Mr. Elliott. He expressed his conviction that much of the value of photography as an art depended on the improvements in instantaneous photography, and Mr. Blanchard appeared in the charming pictures exhibited to have left little to hope for or desire in perfectness.

Mr. **Blanchard**, at the request of the Chairman, explained the working of Elliott's instantaneous shutter as attached to a camera on the table, showing that it gave a certain amount of control over the rapidity of the exposure. In answer to questions, he stated that the greater part of the pictures exhibited were by Dallmeyer's rapid single stereo lens, some few by a pair of French portrait lenses, and a few by Squire's portrait lenses. He also stated that the negatives were mostly finished in the field, such little intensity as they required being effected at the time they were taken.

Mr. **Nurton** exhibited some very fine specimens of portraiture, the negatives taken, he stated, with Mr. Blanchard's collodion.

Mr. **Bockett** exhibited some good specimens on opal glass. He said they were taken in an improvised copying camera on wet collodion. He had some difficulty at first in getting a good tone, but he had found that hydrosulphate of ammonia, one drop in four drachms of water, gave a very good tone.

Mr. J. T. **Taylor** said he believed Mr. Simpson had stated at the North London Meeting that no tone could be produced by that agent.

Mr. **Simpson** said he had used it many years ago. Mr. Blanchard was, he believed, in the habit at times of using it to give a black tone, by reflected light, to transparencies for the lantern.

Mr. **Simpson** then showed some examples of Messrs. Helsby's photographs on opal glass, which were much admired.

In the course of a conversation on the difficulty of obtaining opal glass ground and polished like patent plate, Mr. Hughes stated that it was kept in stock at his establishment in Oxford Street.

The **Chairman**, after a vote of thanks to all the gentlemen who had exhibited specimens, called attention to the forthcoming exhibition at Berlin, and distributed copies of the rules for exhibitors.

Mr. **Frank Howard** then read a paper "On some of the Defects in Landscape Photography" (see p. 125).

After a conversation on the interesting suggestions made, the proceedings terminated.

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Correspondence.

THE PANTASCOPIC CAMERA.

Sir,—The discussion of the merits and demerits of Mr. Johnson's ingenious camera is interesting, but the introduction into the discussion of personalities, though natural, is a pity, it is, however, but just to all parties, whether purchaser or vender, intending or actual, to point out to them the specialities of the camera, beneficial be they, or the contrary. To this, I fully believe, Mr. Johnson will himself assent, and therefore, will forgive me for pointing out to him that his own description of the peculiar advantages of his camera is so worded as (unintentionally) to mislead: for it is not really true that the picture is taken on a flat plate, unless it is really true to say that a picture is taken on a flat piece of card-board, if, when the picture is being taken, the card-board is bent into the arc of a circle. Like the witch's prophecy, the words are both true and false; the good they promise we do not get, the ills they apparently promise to shun, we do. Let me refer your readers to fig. 1:—the problem is to take by Mr. Johnson's camera a view embracing an angle of (say) 180°. Let us trace the action of the instrument. Let us suppose we are looking towards London Bridge from the centre arch of Southwark Bridge. Let L be the lens, and *p.p.* 1 be the flat plate: as the optical axis of L must always be perpendicular to the flat plate, its first position will be L *p.* 1; when it has rotated say to C, the position of the flat plate will be *pp.* 2; when to *d*, *pp.* 3, and so on till it rotates and points to *g*, when the position of the flat plate will be *pp.* 6. If, therefore, at the commencement of the work, we could have bent the flat plate into the curve *p*, *c*, *d*, *e*, *f*, *g*, and had held it in the curved form, until the lens had

Fig.2.

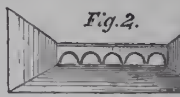
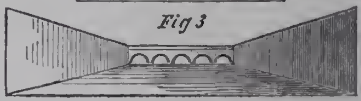


Fig 3



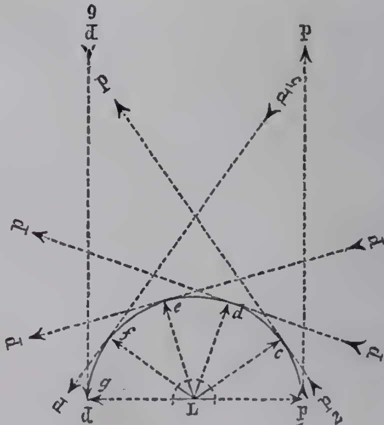


Fig.1

completed its rotation of 180°, we should have had a little more accurate representation than we get on the flat plate (for strictly speaking the flat plate forms, not a curve, but a polygon), and one precisely similar to what the representation would have been by Mr. Sutton's camera. So far, then, as to the flat plate principle of this camera, and now for the disadvantages connected with it. If the print from the negative be held in a curved form, there will be no distortion; if, however, the print be mounted on flat card-board, as Mr. Johnson's are always mounted, the distortion becomes great indeed:—*e. g.*, in the supposed view of London Bridge and the river, in fig. 2, the width of the river is seen here projected on a *curved* surface, and is =12; but in fig. 3, the same print is seen as mounted on a flat surface, and the width of the river is =20. This, it may be said, is an extreme case; so it is; but my object is to teach people that there is error, and to show the nature of the error, that is incident to all rotating cameras. I am, sir, yours faithfully, ARCHITECTON.

March 8, 1865.

COLLODIO-CHLORIDE OF SILVER.

SIR,—I beg to hand you a few specimens of prints I have made by your process. In my first attempt I tried a collodion, the formula of which was—

Ether	4 drachms
Alcohol	4 „
Cotton	4 grains
Silver	8 „
Chloride of Sodium	3 „

The prints made with this were poor and flat. That marked (1.) is a sample. I then added four grains more of silver and tried again. The print marked (2.) is a sample. These were toned in an old lime bath, and fixed with hypo. I saw that where the collodion had run in a streak down one of the prints that it was much brighter. I determined to try a thicker collodion, and also to try other chlorides. I procured chlorides of ammonium, barium, magnesium, and sodium, and mixed up several lots, of which the following are the formulæ:—

Sodium Collodion.

Ether	4 drachms
Spirits of wine	4 „
Nitrate of silver	12 grains
Chloride of sodium	2 „
Cotton	5 „

Ammonium Collodion.

Ether	4 drachms
Spirits of wine	4 „
Cotton	5 grains
Chloride	2 „
Nitrate of silver	14 „

Barium Collodion.

Ether	4 drachms
Spirits of wine	4 „
Cotton	5 grains
Silver	14 „
Chloride	4 „

In this collodion there was a heavy precipitate, perhaps nitrate of barium, and from this cause—the precipitation of silver—the great insensitiveness of the paper probably arises.

Magnesium, after Mr. Cooper's formulæ.

Ether	4 drachms
Spirits of wine	4 „
Cotton	5 grains
Silver	20 „
Chloride	4 „

Samples of the prints made with these collodions are marked (3.) and with the name of the chloride. All of them were toned and fixed with the bath of which you give the formulæ in the YEAR-BOOK.

Those marked (mixed, 3) were made with a mixture of the above collodion, viz.:—Two parts each of the magnesium and ammonium, and one part of the sodium. I think the peculiar colour is rather due to the toning bath than the mode of preparing the paper—as I have made prints with the mixed collodion, and toned with an acetate of soda and gold bath. The formula of which is—

Chloride of gold	15 grains
Water	35 ounces
Acetate of soda	45 grains
Bicarbonate of potash	75 „

The print marked (4.) is a sample of this. It was fixed with sulphocyanide of ammonium. With regard to the sensitiveness of the paper, I find them to stand in the following order:—Ammonium, mixed, magnesium, sodium, and lastly barium. Comparing them with albumenized paper, excited on a sixty grain bath, I find the three first to be *three* times as sensitive, the sodium not so sensitive even as the albumenized paper, and the barium *very insensitive;* would take perhaps *twice* as long as the albumenized paper. I may state that the print marked (4) was printed in ten minutes in sunshine.

I am inclined to give the preference to the magnesium, as being more easily prepared, and the results not at all inferior to the others. The above collodions set very quickly, too quick for comfortable working. I intend to try a little more spirits of wine in my future experiments.

I think a tolerably thick collodion should be used, so as not to sink entirely into the paper, and to leave a good margin for free nitrate, to secure brilliancy. (The paper used is rive plain.)—I am, sir, yours faithfully, A. A.

[The specimens enclosed by our correspondent are very interesting. One of those marked, "Ammonium 3," is the most perfect and pleasing to our taste.—ED.]

SUGGESTIONS FOR A SUCCESSFUL PHOTOGRAPHIC EXHIBITION.

SIR,—Will you kindly allow me to add to your correspondent's suggestions of last week a few ideas that have occurred to me for the successful carrying on of a photographic exhibition.

Let a charge of a guinea be made to all exhibitors, and thus raise a fund of say £300, and of this devote £100 to prizes; thus, a grand prize cup £30, second ditto £20, third a piece of plate £10, and make up the remaining £40 into about 10 prizes of albums, silver and bronze medals, &c.

In the next place, only keep the exhibition open a fortnight, and finish it up by a grand conversazione, and distribution of prizes by the lord president.

By this course, I believe the greatest success will be obtained.

Reduce also the number of portraits exhibited, people *will not* go to see them.

With regard to the F.R.P.S., I am sorry to say there is not sufficient *esprit de corps* amongst photographers for any thing of the kind.—I am, dear sir, yours truly,

SAMUEL FRY.

Kingston, March 15, 1865.

Talk in the Studio.

ANOTHER NEW PRINTING PROCESS.—Mr. J. G. Tunny, of Edinburgh, has favoured us with a specimen print of a new printing process, requiring neither hyposulphite, nor a sulphocyanide to fix the print, and in which neither chloride, bromide, or iodide is used. The specimen we have received is on plain paper, of a pleasant warm grey tone, and it is stated that the paper was prepared, printed, toned, and fixed in thirteen minutes. We hope shortly to be in a position to state the details of the process.

MORE SUICIDES WITH CYANIDE.—The use of cyanide of potassium as a deadly poison, is becoming lamentably common. Two inquests have been held during the last week, on persons who had committed suicide by this poison. A discharged soldier mixed a quantity in beer, and drank it off, and after a few minutes of terrible agony, died. A woman a few days later, died from the effects of a dose of cyanide.

The Amateur Photographic Tourists' Club.—This club, which was initiated by Mr. Frank Howard, by means of a letter in our columns some weeks ago, has now been definitely organized. It is to hold meetings in the country at least once a month, from April to September, and from October to March it will hold meetings for the exchange of specimens, &c., &c. Every member is expected to produce six large negatives, or twelve stereoscopic, during each year, and to forward a print from each negative taken during the season, in time for the first October in-door gathering, a portfolio of such prints being kept with all particulars of process, lens, exposure, &c., written on each print. An annual subscription of ten shillings covers the expense of membership. These and some other provisions constitute the general laws of the club, which promises to be a successful and satisfactory mode of association amongst amateur photographers. Amongst the places planned for visiting during the coming summer, we may mention Burnham Beeches, Chertsey, Abbey Wood, Boxhill, Datchet, and Snaresbrook. We may safely predict for them some very delightful days' rambles.

Photography in the Dublin International Exhibition.—We call the attention of those of our readers interested in the matter, to an advertisement which appears in another column, stating that tenders will now be received from photographers for the privilege of photographing the various objects and ceremonies in the forthcoming International Exhibition at Dublin.

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To Correspondents.

A. Gray.—Dr. Vogel did not state the strength or specific gravity of the ether and alcohol upon which his calculation of the relative cost of the Wothlytype process and albumenized paper printing was based. 2. It is perfectly easy to obtain any kind of tone, and especially the black tones, with our process of printing with the collodio-chloride of silver. To get the black tones we use the lime bath. 3. The price you mention for methylated ether is probably a fair retail price; it can be purchased much cheaper in large quantities. Methylated spirit of about ·820 sp. gr., the strength we use for printing purposes, can be had at less than half the price you name. 4. The tone and general quality of the Wothlytype print you enclose are very bad. The Association printers get very good prints. We have not tried their prepared collodion; but the prints we obtained from our own argento-uranic collodion were exceedingly fine. Try again. You will obtain something better than the print you have forwarded.

Cantab.—For open air portraiture a north aspect is best. A canopy projecture four or five feet overhead, and wings, moving on hinges, to regulate the position, projecting about the same extent at each side, will assist you considerably. The canopy may be placed about eight or nine feet high.

C. T. N.—The carbon may be obtained of the dealers in philosophical instruments. The coil is not required.

K. L.—The granular effect of a copy from a photograph arises from the little projections or grain on the surface of the original, each being illuminated vividly; each white spot in the print you have forwarded will correspond with an intense point in the negative, which corresponds with the grain or texture of the original print. The only mode of getting rid of it is to use a well rolled print to copy, and to place it in a position where the light approaches from all directions. 2. Almost any collodion in good working condition will do. 3. Intensity is generally obtained more slowly just in proportion as the illumination has been weaker. 4. A whole plate lens to cover perfectly should have an equivalent focus of about fourteen or fifteen inches, or about twelve inches from the back glass. A lens of shorter focus may be used for heads and for sitting figures, but if the plate have to be well covered the lens must be stopped down. 5. An exposure of from fifteen to twenty seconds at this season of the year, under the circumstances you describe, is not a long exposure.

B. O.—Messrs. Helsby's method of printing on opal glass is a secret process, but is not patented. 2. We do not know anything of the lens you mention. 3. We believe Mr. Pouncy's prepared paper can be procured by applying to him at Dorchester.

Tyro.—The developing process given by Mr. Walter Woodbury produces very fine prints, as does also that of Mr. Sydney Smyth. We have not seen Mr. Sutton's process of development-printing applied to enlargement; but some of the richest toned prints we have seen have been produced by it.

O. K. Walker.—The discoloured effect of your prints probably arises from the use of an old, or acid fixing bath. We have not had time to try the paper.

Charles West.—One of the difficulties of the toning bath of gold and sulphocyanide, is the tendency to produce the steel blue tone of which you complain. This is not always the case, but we have scarcely satisfied ourselves of the conditions which cause it. It is probable that you will find, with our collodio-chloride process, that toning in one of the ordinary gold toning baths, and then fixing either with sulphocyanide or hyposulphite, will give the most uniform results. We also find that, unless the paper and collodion are both suitable, it is desirable to use paper prepared with arrow-root, that prepared for the Wothlytype process answering well. It is probable that your negative is scarcely sufficiently vigorous for the Wothlytype process, as very dense negatives are required for the best results by that process. Nitrate of uranium is a greenish yellow salt, and pure sulphocyanide colourless and slightly deliquescent, but you can scarcely judge of their purity by their appearance. We find that, with collodio-chloride of silver, prints require about the same over-printing as albumenized paper.

E. Bray.—Beaufoy's acetic acid may be used in the developer. It is not necessarily of a definite strength, but as a rule the proportion required is about three times that of glacial acetic acid. 2. The only use of alcohol in the developer is to make it flow over the plate freely, without running into greasy lines. The least possible quantity which will make it do this should be used. Try first doing without any, and then add a little at a time if necessary. With a new bath none will be required. 3. Do not add alcohol to the bath. Try adding one drop of distilled water to an ounce of collodion. If that fail to make the film less repellant, mix a little of a less repellant collodion with that in use. 4. A weak negative bath will frequently give weak negatives. If your bath has been long in use, and begin to work badly, you may test its strength with propriety. 5. The conditions which permit lengthened application of the iron solution without producing fog, depend upon bath, developer, and collodion all being in good condition. An acid bath, and a deep coloured collodion favour this possibility.

Zinc.—A plate of zinc is prepared for zincography first by scraping smooth, and then rubbing with pummice-stone. It is then grained by rubbing with fine sand and water, and a zinc muller, and then washed perfectly clean. The transfer having then been slightly damped by placing between damp sheets of paper a few minutes, is placed upon the plate and passed through the press. It is then etched and printed in the same manner as a lithographic stone. 2. "Pistol camera" is the name given by Mr. Skaife to a miniature camera with an instantaneous shutter having a trigger movement.

Magnesium Wire. The defects you describe arise from the collodion being over iodized. The addition of a little plain collodion will prove a remedy.

H. Clifford.—Your negative, enclosed in a letter without other protection, arrived in a hundred pieces. Of the nature of the markings about which you enquire, we can form no opinion, as no fragment was sufficiently large to show the character of the stains.

J. M. Burgess.—We do not find any advantage in using more than 1½ gr. of a chloride in the collodion, and with this proportion it is easy to get sufficient silver in the collodion without using water, which, if introduced to any extent, is apt to cause reticulation. We have not heard anything lately of the Marseilles competition for enlargements. It is to be hoped that the discussion as to the toxical effects of ether, &c.. will cause more attention to be given to the ventilation of the dark room.

Novice.—When you speak of a "positive nitrate bath," we presume it is a bath for collodion positives. Excess of acid in such a case would a little interfere with sensitiveness. It would generally increase contrasts between black and white, but, under some circumstances, great excess of nitric acid would cause fogging.

T. H. Redin.—There can be no doubt that the hyposulphite of lime will answer well for fixing. We remember seeing some prints by Professor Taylor, who first suggested the use of hyposulphite of lime many years ago, which had stood without the slightest change for several years. The only advantage hyposulphite of soda has is its cheapness.

H. T. B.—Most probably from imperfect fixation, but possibly some defect in the paper.

A New Subscriber.—The dirty yellow colour in all your prints is the result of imperfect fixation. The hyposulphite solution is not strong enough, or the prints are removed from it too soon. Print deeper, and tone deeper, dispense with the iodide of potassium, and fix perfectly, allowing the prints to remain not less than fifteen minutes in a solution of hyposulphite, one ounce in five of water. The glass house you describe will permit you to use the lens you mention. "Hardwich's Manual" is published by Churchill. There is no work on photographic optics. All the back numbers of our Almanac are out of print, except 1861 and 1864, of each of which there are a few copies. Persevere, and let us see some more of your work.

E. N.—We cannot say, absolutely, which intensifier is best, iron and citric acid, or pyro and citric acid. Both produce good results. The former has the advantage of being always ready for use, as it does not deteriorate with keeping, and gives great delicacy. 2. Tartaric acid has the disadvantage of giving a very blue deposit, which readily allows actinic rays to pass. 3. Yes: with the lens you mention and the largest stop. In some, we believe, the largest stop was made slightly larger, without the picture suffering in definition.

Cyanide.—The difference is not material, but the sharpest angle is best. It is difficult to state absolutely how much glass will be sufficient, but probably fifteen feet in length of roof and sides will be ample. The portion for the sitter need not be higher than the rest. You will have, by carrying out your present intention, an excellent glass room.

C. W. H.—We will communicate with Mr. Gill.

Alpha.—We should prefer bromo-iodized collodion and iron developer, say that employed by Mr. Vernon Heath, consisting of eight grains protosulphate of iron, twenty minims acetic acid, and one ounce of water.

An Aspirant.—The *Art Student* is published monthly, by Messrs. Hall & Co., Paternoster Row. Price One Shilling.

A Subscriber.—The engraving, a photograph of which you enclose, is "The Heart's Misgivings," by Frank Stone. It has been published within twenty-eight years, and would be copyright if the proper steps had been originally taken to protect it. Whether this was done or not we cannot tell; but we fancy not, as we see German lithographs of it as well as photographs regularly and openly sold.

Errata.—In the article on Dr. Vogel's method of testing silver solutions in our last, top line of first column in p. 111, for "cobwebs" read "theory:" the passage should read "cobwebs of flimsy theory." There are some other printer's blunders in the article not important to name. In the article concerning backgrounds on p. 53, for "amber," which occurs two or three times, read "umber."

"Pictures of Niagara," and several other articles are compelled to stand over until our next. Several correspondents in our next.

All the registrations of this week have received attention, but the acknowledgment stands over for lack of space.

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All Communications for the Editor to be addressed to
32, Paternoster Row.

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THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 342.—*March* 24, 1865.

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NEW MODE OF INTENSIFYING—RED NEGATIVES.

On another page, we give an interesting and important article, by Mr. Carey Lea, which appears in the *American Journal of Photography*, on a method of colouring negatives scarlet and other variations of red. Attention has been turned for some time past, to modes of producing non-actinic colour in negatives, as a means of increasing their printing intensity, without over-loading them with a thick deposit of silver. It is argued very naturally, that, wherever density has to be obtained by piling on silver, a certain amount of delicacy and fine definition are lost. The loss may be almost inappreciable, but it assuredly takes place in greater or less degree. If, therefore, the opacity to actinic light of the dense portions of the negative can be increased by changing their colour, as well as by increasing their thickness an undoubted gain is secured.

It is pretty generally agreed on all hands, that if exactly the right amount of printing intensity can be secured in a negative, by the simple act of development, it is very desirable that it should be done. An iron negative produced with chemicals in good order, good light, and proper exposure is generally very beautifully delicate and harmonious. When the right intensity is secured at one operation nothing better can be desired; but the moment it becomes necessary to intensify, there is a risk of losing some delicacy and some harmony, the utmost skill and judgement being necessary to secure a perfect result. A solution of pyrogallic acid and a little silver, or solution of iron with citric acid and silver, will answer the purpose very well where a moderate amount of intensity is present to begin with. But wherever it happens that, from the condition of the chemicals, the quality of the light, the low temperature, or the imperfect illumination of the subject, a weak image is obtained to begin with, which requires much intensification, there is considerable risk of loss of delicacy, and occasionally of stains, fog, and pinholes. It, becomes, therefore, in such cases, an important question as to what means are most efficient, and how weak negatives may be made to yield the best results with the least danger of loss; and as we have said, the idea of securing a non-actinic colour is a very natural one, and well worth some consideration.

The modes of converting the silver forming the image into a chloride, iodide, or sulphide are pretty well understood, and generally disliked from the simple fact that they are not stable when produced, changing under the action of light, and sometimes decomposing. The application of a solution of iodine either in alcohol, or in an aqueous solution of an iodide, will increase the opacity of a negative, and if a dilute solution be used; and its action be stopped quickly when the deposit appears by transmitted light of an olive tint, this is perhaps one of the best modes of intensifying. But it has this disadvantage: the solution when first applied to the film is at times a little irregular in its action, and by the time the effect has become tolerably regular, the colour has often gone too far towards a primrose yellow, and not only allows actinic light to pass through, but readily changes under the action of light. A variety of tints may at times be produced by means of iodine alone, varying from orange to ruby by transmitted light; but we have found these colours became pale when the negatives were exposed to sunlight, and negatives so treated have become too weak to print. A chloride of mercury, followed by an iodide, may, by slightly varying the proportions and mode of manipulating, be made to yield negatives of various colours, such as green, yellow, and orange, but the results are always uncertain and unstable, generally becoming denser under the action of light, sometimes becoming quite transparent, and sometimes decomposing. Mercury followed by a sulphide is liable to some of the same objections. A chloride alone will slightly increase density, but the image will change under the action of light. The use of a sulphide is very common with some operators; but it has several objections. Unless skilfully applied it is very apt to cause stains; it is very offensive to use; is apt to dissolve partially and cause stains on varnishing, and the negatives have the reputation of changing when it has been used. Except for special purposes, each having its use as a reserve power, we are inclined to believe that of the hitherto known modes of intensifying, none are so trustworthy, notwithstanding the objections we have named, as those in which a further deposit of silver is secured.

Methods of dyeing the negative generally have been suggested; but in such case the whole film is coloured, transparent parts as well as those which are opaque. And the result, whilst a slight improvement on a weak negative, is not much additional intensity. The effect is similar in its character and result to printing in diffused light instead of sunlight, slower printing and more vigour are secured. We have found that Judson's dyes, applied to a negative varnished or unvarnished, answered very well for this purpose.

The introduction of distinctly new agents for intensifying, to produce a definitely new effect, is an interesting circumstance, and photographers are much indebted to Mr. Lea for the suggestion. The agent in question is a sulphantimoniate of soda, described by Mr. Lea, as Schlippe's salt; it is not a preparation much known in commerce, nor is it very familiar on this side of the water as Schlippe's salt. When tersulphide of antimony, carbonate of soda, sulphur, and hydrate of lime, in due proportions, are digested together in water for some hours with the aid of heat; carbonate of lime, antimoniate of soda, pentasulphide of antimony, and sulphide of sodium are formed.

The two latter combine to form a double sulphur salt of antimony and sodium, which is the salt Mr. Lea proposes for intensifying, as producing a variety of non-actinic colours in the negative, chiefly variations of red.

Schlippe's salt, as we have said, is not easily obtained in commerce, and we have not had time yet fully to test the action of some we have recently prepared by the formula given by Mr. Lea. From the experiments we have already made, we are satisfied that it affords a most valuable auxiliary to our intensifying agents. We have obtained various tints all very non-actinic, reddish-black, indian red, russet, scarlet, &c. Applied after bichloride of mercury, it gives, in some instances, a tint of a salmon or flesh colour; but after iodine, its action is most energetic, and the results most remarkable.

How far negatives treated in this way will be stable remains to be proved. Mr. Lea speaks, however, of the experience of a twelve-months favourably. We shall return to the subject shortly, stating our experiences in detail and their results. In the meantime, we thank Mr. Lea for the addition to the *repertoire* of the photographer, of what promises to be one of the most valuable auxiliaries in his reserve force of intensifying agents.

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DUBLIN INTERNATIONAL EXHIBITION.

Most of our readers who applied for space in the Dublin International Exhibition have by this time received an intimation of the amount allotted to them, and we are happy to state that few will be disappointed in the amount. The demand has certainly been in excess of the space at the disposal of the committee, but not nearly to the extent which, at first calculation, was feared, so that, except in cases where the demand made was thoughtlessly large, very little curtailment of the amount claimed has been found necessary. Where some curtailment has been found necessary, photographers will, we feel sure, give the committee credit for discreet consideration in making the necessary excision. The following letter from Sir Jocelyn Coghill gives official intimation of the facts:—

Dublin International Exhibition.
Exhibition Palace, Dublin.

Sir,—I beg to announce to photographers, through the medium of your journal, that the allocation of space in the photographic department of the approaching Dublin International Exhibition is now complete, and that all applicants will shortly receive replies to their communications. The sub-committee wish at the same time to mention that in consequence of the unexpectedly large demand for space, the gallery appointed for the exhibition of photographs would be inadequate for the purpose were no reduction made in the number of photographs for which space has been applied. Under these circumstances the committee has endeavoured to make the necessary alterations with due regard to the interests of individuals and the success of the exhibition, and would appeal to the forbearance of those exhibitors whose demands for space it has been found unavoidable to curtail.

The committee have also to request that exhibitors will furnish corrected lists of their photographs, &c., as soon as possible after the receipt of the allocation papers, for the purpose of the catalogue.—I remain, dear sir, yours very faithfully,
J. J. Coghill.
Chairman, Sub-Committee, Photographic Department,
Dublin International Exhibition.
March 16th, 1865.

The best time for sending in the pictures will be between the first and fifteenth of April, after which no contributions can be received. The rules for the guidance of exhibitors will be found at p. 519 of our last volume.

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MEDALS AT THE BERLIN EXHIBITION.

We have learnt just before going to press that the Berlin Photographic Society have come to the conclusion to award medals for the best photographs exhibited at their forthcoming Exhibition. The details and conditions have not yet reached us. We are glad to be able to make this announcement, for notwithstanding any arguments on the impolicy of such awards to merit, which must depend much on variety of tastes, we are convinced they act as a beneficial stimulus to excellence. It is perfectly true that there is no authoritative standard by which to compare photographic pictures, but that fact does not prevent the photographer from desiring the favourable verdict of all competent to give an opinion. It does not prevent the professional critic from giving his opinion freely and unhesitatingly. Neither should it, we think, hinder a committee of impartial gentlemen, of taste and judgment, giving an authoritative verdict, and embodying it in the form of a medal. We believe this resolve on the part of the Berlin Society will have a good effect on their Exhibition.

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Jottings for 1865.—No. 2.

BY A PHOTOGRAPHER'S ASSISTANT.

Collodion Printing.

Photography is essentially an experimental science, owing its birth to accident, its subsequent highly successful career to careful observation and intelligent research, in the exercise of which experimentalists have frequently proved that improbabilities and apparent impossibilities are sometimes great scientific truths, and as such may be turned to good account, and in spite of sceptical "pooh poohs," those so-called absurdities stem the tide of prejudice and ultimately are generally admitted as proved facts, and facts are stubborn things. Turn and twist them as we will, they remain facts still; though floods of sarcasm or the artillery of the subtle logician be brought to bear to hasten their destruction.

A science thus founded on speculation, and whose progressive career depends on the labours of the experimentalist, must ever be on the move, progress its motto: wrest what it may from the capacious stores of nature, its cry must still be "more, more." Oh, 'tis a God inspiring impulse that bids men thus employ the powers of their minds in seeking out perfection. Let sceptics mock and ignorance fear, truth must prevail though she wear not the robes fashioned for her by a short-sighted orthodoxy; and an experiment, when successful, however apparently absurd or inconsistent the means employed, call it what we will, 'tis nature truly interpreted.

When nitrate of soda was introduced as a useful adjunct to the printer's sensitizing solution, it was pronounced by more than one acknowledged authority to be a non-scientific imposter, but the test of time has served to confirm its value, and due credit has been rendered to the sagacity that prompted a first experiment with the disputed substance.

We have been taught to believe that experience is the parent of wisdom. If this doctrine be accepted as correct, there must of necessity be a lack of wisdom in some quarters of the photographic world, for in spite of repeated experience, should a process be offered that is not in accordance with preconceived notions, there lack not those who, after a languid trial or two, that prove as unsuccessful as they desire, then turn round and dogmatically denounce the new comer as an impossible or improbable absurdity. Happily we have among us men of higher thought, men who gain strength from repeated failures; adopting rightly-conceived principles, they work on and on until perseverance earns its merited reward. Scepticism now convinced, shrugs its shoulders and exclaims, "Well, who ever would have thought it!"

Bringing the above prefatory remarks to bear on the subject to be discussed in the present paper, we will allude briefly to the Wothlytype, which is denounced by a high authority as a move in the wrong direction. On what foundation this assertion is based we are at a loss to understand, nor can we comprehend why Mr. Wharton Simpson's collodio-chloride process should share in the same sweeping condemnation, as in a contemporary to the News we find it pronounced slow, weak, in a word, unsatisfactory, not worthy to claim relationship with the first-named stem from which it sprung.

Such statements cannot be noticed but as indirect attacks, impugning the veracity of those who are working to promote the general weal; moved by a deep-rooted love of science and their art, they give their honest disinterested testimony in order that ingenious inventions or discoveries might receive the recognition they deserve. The Wothlytype, as we before observed in another paper, is founded on principles strictly scientific, and we now add, so also is the new process suggested and discovered by Mr. Simpson, and the reason why it is not generally recognised as such is, because detractors know but little of the conditions requisite in successful printing operations, nor is it natural they should completely understand them, seeing that their experience in this direction is confined to such close limits, half-a-dozen prints, perhaps, printed at a drawing-room window, and afterwards toned in a saucer, being the best data they have access to from whence to draw inferences. Our experience having taken a somewhat wider range, might perhaps account for the discrepancies in the characters given of the collodio-chloride process. Daily practice we offer as our credentials. Operations ranging from half-a-dozen to 120 and more sheets per diem, watching the printing frames, conducting the prints through each subsequent operation, the continued exercise of careful studious observation, tracing failures to their causes, seeking out leading principles, and proving or disproving theories by the application of practical tests; and surely, if experience is admitted as a judge, without egotism we may say our testimony in favour of collodion printing, as suggested by Mr. Simpson, is as worthy of acceptation as the statements of those who, on the strength of an ill-directed experiment or two, pronounce this kind of printing a mistake. "But what has collodion printing to do with experience in the working of the old systems?" All in good time, we shall devote the remainder of this paper to a reply.

When Mr. Simpson made known the interesting fact that chloride of silver is held in suspension by collodion, we were at once convinced of the importance that attended that discovery, and directly determined to work out and improve a process the germ of which was contained in the communication alluded to, and it is with pleasure we add, our labours have already met with success sufficiently promising to encourage us in pursuing further what has been to us an interesting investigation. But wishing to secure the assistance of other experimentalists, we now purpose entering into some details of our proceedings, by explaining the principles that govern each operation, leaving definite formulæ to be presented when entire success attends our labours, for the results we have secured although quite equal to average albumen prints, still we aim higher, and are convinced the process is capable of producing pictures equal to anything printed by any now known process; nay, better than by the old systems, for good collodion prints are marked by their softness and beauty, combined with an unusual rendering of the most minute detail, a combination of excellences rarely to be found in albumen pictures, and then only when negatives possessing better than average qualities are employed.

Proceeding to details, the first article that demands attention is the paper. A sample as thin, smooth, hard, and as grainless as possible should be employed. Sizing is not an absolute necessity, but if employed, it should be applied to the back surface, which will prevent curling, at the same time aiding to keep the collodion from penetrating too deeply the opposite side of the paper. Great care is necessary to secure an even coating of the size, or markings in the print will most assuredly follow, from the following described cause. Supposing the paper absorbs the size in unequal thicknesses, an unevenness in the depth of the layer of collodion follows, and a little reflection will make perceptible how the markings alluded to are produced, for the deepest deposit of the sensitive collodion, caused by unequal absorption prints faster and more vigorous than surrounding thinner portions, thus producing the objectionable stains, as will be clearly proved in our further remarks. For the same reason paper of unequal texture should be avoided, as its employment will entail the same evil.

The substance that next demands attention is one of special importance, and to which careful study should be directed, for on it hangs the destiny of the process—we allude to collodion. We have made and experimented with many samples with as numerous changes in results. Films of a powdery kind sinking into the paper yielding dead flat pictures on an unglazed surface. Collodions firm and horny, producing bold brilliant prints, that raise high the hopes, and quicken the pulse with flushing throbs of rapture, the lips to cry success. But alas! washing brings disappointment. The films blister, slip, and are lost in the running stream; or should they by the exercise of additional care be borne successfully through the trying ordeal, the prints in drying split and tear in every direction. If by any means we could secure adhesion with this kind of film, the process might at once be declared a success.

The use of a collodion whether of the powdery or opposite description, if too dilute will lead to failure, as in such condition they yield neither vigour nor brilliancy, although a powdery sample whether thick or thin adheres firmly to the paper, bidding defiance to the most vigorous washing. We may sum the matter up in a few words. A horny film gives a brilliant image, but will not submit to washings and subsequent drying, whilst a collodion of a powdery kind lacks vigour, but will bear almost any amount of washing, so that by combining the two opposite properties we have obtained our best results. Taking a sample of collodion composed of pyroxyline prepared at a low temperature, (say 130° with Hardwich's formula No. 1), and adding to it an equal quantity of an ordinary negative collodion, thus combined they work satisfactorily if care is observed in securing sufficient body or glutinosity, and also in providing the necessary quantity of the sensitive salts in their requisite proportions.

The conditions necessary to produce direct printing in collodion are precisely those adopted in the generally employed systems. That is to say, the same in principle if not in detail: 1st nitrate of silver, 2nd a chloride salt, which by instant decomposition forms the sensitive compound named chloride of silver, but prints produced by this salt alone, though rapidly printed, the pictures lack vigour, an excess of half-tone, but feeble shadows and clouded high lights. To improve such unsatisfactory results we have recourse to a salt possessing opposite properties, viz., an organic compound of silver formed by combining some organic substances which unite and form the necessary compound which substance, unaided, prints slowly, yielding depth of shadow and clean high lights, but little or no middle tints, as might easily be proved by an attempt to print on plain albumen. By admixture of the chloride with an organic salt of silver, the requisite conditions are secured. The first named salt causing sensitiveness, which desirable property it imparts by catalysis, to the organic salt, when together they are submitted to the decomposing action of light. In ordinary printing processes, this organic matter is supplied by the sizing in plain paper, or by albumen when the paper so named is employed; but in collodion printing, not only must the silver salt be supplied, but also the chloride and organic substances. To combine the first is an easy matter by following out the directions given by Mr. Simpson, or (if the experimentalist manufactures his own collodion), by saturating the alcohol with silver before dissolving the pyroxyline. The quantity of silver thus taken up can be easily ascertained by weighing before triturating in a mortar. The necessary proportion of chloride of calcium dissolved in a separate portion of alcohol is added after the pyroxyline is in a state of solution, when a chloride of silver in minute atoms is formed and held in suspension. In seeking an organic substance, soluble in alcohol, a wide field presents itself, viz., gums, resins, saccharine matter, oils, &c. After giving trials to a large number of assorted substances we select castor oil or sugar—castor oil gaining the preference, it being quite soluble (if pure) in alcohol, and when used in connection with the salts before described it assists materially in imparting depth and brilliancy to the picture. So far as we have proceeded, 4 drops of the oil dissolved in a small quantity of alcohol has been added to each ounce of collodion, but as richness and vigour must depend on the presence of organic matter, it would be well to start from this point, increasing the quantity until the maximum is arrived at, always remembering to leave unmolested a portion of the free nitrate of silver. Admitting that a quantity of sensitive collodion is mixed, that produces prints too vigorous, a remedy is easily provided by adding plain collodion; *but it must be distinctly understood the maximum of sensitiveness can only be obtained when the largest available quantity of the silver salts is present in proper proportions; so that where vigour has to be dispensed with, a diminution of sensibility will naturally follow, as by an increase of surface the molecules of silver are more widely diffused, and the atoms simultaneously reduced on exposure to light, are fewer in number*, and we may here observe, the same rule applies to the varying thicknesses of the collodion film, the atoms being more numerous in a thick than in a thin coating, thus producing increased sensitiveness and *vice versa*. There at once is explained the reason why some persons have failed, and pronounced the process slow and weak. Widely separated atoms of silver and no organic substance present; under such conditions failure becomes a certainty, success a miracle.

Presuming that a satisfactory sample of the sensitized collodion is prepared, the next operation is coating the paper, and here we also find precautions necessary. The paper is laid on a plate of glass and the collodion is poured on in the usual way; commencing nearest the thumb and leading with a slight stream from the bottle until sufficient is present to flow quickly over the whole surface, when the surplus is returned after the well known fashion. The paper is now removed from the support, and hung up to dry in a temperature that must not fall below 60° Far., nor rise above 80°. Cold air causes the film to become opalescent, thus producing a fogginess in the print, whilst a high temperature dries the collodion too quickly, and the danger of losing the film in washing is largely increased. When dry the print is improved by ammonia fuming, or it may at once be placed in the printing frames, precautions being taken to remove any undried portions of collodion that sometimes adhere to the edges and corners of the paper, as it dissolves the varnish, and this endangers the negative.

The image should be printed deeper than required in the finished print. This drawback will probably be removed when we introduce more organic matter. A slight washing—then toned and fixed in the usual solutions and manner. But little subsequent washing seems to be necessary, as we have prints that were washed but ten minutes, that exhibit as yet no tendency to change or discolour, the picture being formed independent of the paper, all traces of the fixing salt are speedily removed. And now, in conclusion, we wish it to be understood that in offering these our first remarks on Mr. Simpson's process we do so free from dictation or promptings of any kind. Mr. Cooper, as an independent gentleman, gives favourable evidence that must be deemed disinterested. Our own experience as a working printer is offered free from any personal feelings in the matter, save a sincere desire to advance photographic knowledge. And in carrying out this object, we here describe well-tested principles by which we are guided in our researches, promising that as more light is imparted to our mind, or whatever increase of knowledge of this interesting process we may acquire, will be freely offered through the pages of the News. We here provide the compass, we ask of our readers to assist us in preparing the chart.

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ENLARGING NEGATIVES.

BY CHARLES WALDACK.

I have lately acquired some experience in copying negatives from negatives. The occasion of this was the impossibility of using the solar camera for dry printing at this season, and this smoky city (only surpassed in this respect by London and Pittsburg). The success which I have obtained is such that I wonder why this process is not more in use. The first condition I think is to obtain a good transparent positive. My experience is, that it should not be made larger than a half or quarter-plate, and with a lens whose principal quality is sharpness or definition. I use for this purpose either a 10-inch focus Ross triplet or a 4½-inch focus carte de visite lens of the same maker. The French and American portrait lenses, I find, as a general thing, give less definition than those made by the good English opticians, but also give a flatter field (are great definition and flatness of field incompatible). The field is, however, sufficiently flattened by the use of a diaphragm, and by making a small positive (using in this way only the central parts of the lens).

The exposure given, I find, should be such that every detail of the negative be reproduced in the positive. To obtain this I use a collodion giving but a little contrast or intensity, unless the negative be very thin, and such as is required for dry printing with the solar camera, when I use the ordinary portrait collodion.

My apparatus is simply the ordinary horizontal solar camera, with the condenser removed. When the sun shines, I place in front of the negative a piece of ground glass, but when the light is diffused, this is unnecessary. In cloudy weather the reflector should as much as possible be kept towards the absent sun. The image of the negative is received on the ground glass of an ordinary camera placed in front of the solar, and at right angles with it.

The advantage of this arrangement is, that all sizes can be made without trouble.

I will, in a few days, send you a canvas print by the process above described; that is, if I can send it by mail rolled on a stick.

Cincinnati.

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PICTURES OF NIAGARA.

Taken with Camera, Pen, and Pencil.

BY J. WERGE.*

The next scenes of our photographic labours were Suspension Bridge, the Long Rapids, The Whirlpool, and Devil's Hole. These subjects, though not so grand as Niagara, are still interestingly and closely associated with the topographical history, and legendary interest of The Falls. And we thought a few "impressions" of the scenes, and a visit to the various places, would amply repay us for the amount of fatigue we should have to undergo on such a trip under the scorching sun of *August in America*. Descending to the shore, and stepping on board the steamer, "Maid of the Mist," which plies up and down the river for about two miles, on the tranquil water, between the Falls and the Lower Rapids, we were "cast off," and in a little time reached the landing stage, a short distance above the Long Rapids. Landing on the American side, we ascended the steep road, which has been cut out of the precipice, and arriving at Suspension

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* Concluded from p. 113.

Bridge, proceeded to examine that wonderful specimen of engineering skill. It was not then finished, but the lower level was complete, and foot passengers and carriages could go along. They were busy making the railway "track" over head, so that, when finished (which it is now), it would be a bridge of two stories—the lower one for passengers on foot, and carriages, the upper one for the "cars." I did not see a "snorting monster" going along that spider's-web-like structure, but can very well imagine what must be the sensations of "railway passengers" as they pass along the giddy height. The span of the bridge, from bank to bank, is 800 feet, and it is 230 feet from the river to the lower or carriage road. The estimated cost was two hundred thousand dollars, about £40,000. A boy's toy carried the first wire across the river. When the wind was blowing straight across, a wire was attached to a kite, and thus the connecting thread between the two sides was secured, and afterwards by means of a running wheel, or traveller, wire after wire was sent across until each strand was made thick enough to carry the whole weight of the bridge, railway trains, and other traffic which now pass along. We went on to the bridge, and looked down on the rapids below, for the bridge spans the river at the narrowest point, and right over the commencement of the Lower Rapids. It was more of a test to my nerves to stand at the edge of the bridge and look down on those fearful rapids than it was to go under the Falls. To us, it seemed a miracle of ingenuity and skill how, from so frail a connection, a mere wire, so stupendous a structure could have been formed; and yet, viewing it from below, or at a distance, it looked like a bridge of threads. During its erection several accidents occurred. On one occasion, when the workmen were just venturing on to the cables to lay the flooring, and before a plank was made fast, one of those sudden storms, so peculiar to America, came up and carried away all the flooring into the Rapids. Four of the men were left hanging to the wires, which were swaying backwards and forwards in the hurricane in the most frightful manner. Their cries for help could scarcely be heard, from the noise of the Rapids, and the howling of the wind, but the workmen on shore, seeing the perilous condition of their comrades, sent a basket, with a man in it, down the wire to rescue them from death. Thus, one by one, they were saved. Leaving the Bridge, and proceeding to the vicinity of The Whirlpool, still keeping the American side of the river, we pitched the camera, not *over* the precipice, as I heard of one brother photographer doing, but on it, and took a view of the Bridge and the Rapids looking up towards the Falls, but a bend in the river prevented them being seen from this point. Not very far above the angry flood we saw the "Maid of the Mist" lying quietly at her moorings.

We next turned our attention to the great Whirlpool, which is about a mile below Suspension Bridge. Photographically considered, this is not nearly of so much interest as the Falls; but it is highly interesting, nevertheless, as a connecting link between their present and past history. It is supposed that ages ago—probably before the word went forth, "Let there *be* light, and there *was* light"—the Falls were as low down as the Whirlpool, a distance of over three miles below where they now are, or even lower down the river still. Geological observation almost proves this; and, that the present Whirlpool was once the great basin into which the Falls tumbled. In fact, that this was, in former ages, what the vortex at the foot of the Great Horse Shoe Fall is now. There seems to be no doubt whatever, that the Falls are gradually, though slowly receding, and they were just as likely to have been at the foot of the Long Rapids, before the deluge, as not. Especially when it is considered, that the general aspect of the Falls has changed considerably, by gradual undermining of the soft shale and frequent falling and settling of the harder rocks, during the last fifty years. Looking at the high and precipitous boundaries of the Long Rapids it is difficult to come to any other conclusion than that, ages before the red man ever saw the Falls of Niagara, they rolled over a precipice between these rocky barriers, in a more compact, but not less majestic body. The same vast quantity of water had to force its way through this narrower outlet, and it doubtless had a much greater distance to fall, for the precipices on each side of the river at this point are nearly 250 feet high, and the width of the gorge, for a mile above and below the Whirlpool, is not more than 700 feet. Considering that the Falls are now spread over an area of nearly three quarters of a mile, and that this is the only outlet for all the superfluous waters of the great inland seas of Canada and America—Lakes Superior, Michigan, Huron, and Erie—and the hundreds of tributaries thereto, it may easily be conceived how great the rush of waters through so narrow a defile must necessarily be. Their turbulence and impatience rather aptly reminding you of a spoiled child—not in size or form, but in behaviour. They have so long had their own way, and done as they liked on the upper river and at the Falls, they seem as if they could not brook the restraint put upon them now by the giant rocks and lofty precipices that stand erect, on either side, hurling them back defiantly in tumultuous waves, seething and hissing and roaring in anger, lashing themselves into foam, and swelling with rage, higher in the middle, as if they sought an unpolluted way to the lake below, where they might calm their angry and resentful passions, and lay there chafed heads on the soft and gently heaving bosom of their lovely sister Ontario. It is a remarkable circumstance that the waters of the rapids, both above and below the Whirlpool, in this defile are actually higher in the middle, by eight or nine feet, than at the sides, as if the space afforded them by their stern sentinels on each side were not enough to allow them to pass through in order and on a level. They seem to come down the upper part of the gorge like a surging and panic stricken multitude, until they are stopped for a time by the gigantic precipice, forming the lower boundary of the Whirlpool, which throws them back, and there they remain whirling and whirling about until they get away by an under current from the vortex; and, rising again in the lower part of the gorge, which runs off at right angles to the upper, they again show their angry heads, and rush madly and tumultuously away towards Lake Ontario. The bed of these rapids must be fearfully rugged, or the surface of the waters could not possibly be in such a broken state, for the water is at least 100 feet deep, by measurement made above and below the Rapids. But nobody has ventured to "heave the lead" either in the Rapids themselves or in the Whirlpool, the depth of which is not known. There is not much picturesque beauty at this point. Indeed, the Whirlpool itself is rather of a fearful and horrible character, with little to see but the mad torrent struggling and writhing in the most furious manner, to force its way down between its rocky boundaries. I saw logs of wood and other "wreck," probably portions of canal boats that had come down the river and been swept over the Falls, whirling around but not coming to the centre. When they are seen to get to the vortex they are tipped up almost perpendicularly and then vanish from sight, at last released from their continually diminishing and circular imprisonment. It has sometimes happened that the dead bodies of people drowned in the upper part of the river have been seen whirling about in this frightful pool for many days. In 1841, three soldiers, deserters from the British army, attempting to swim across the river above these rapids, were drowned. Their bodies were carried down to the Whirlpool, where they were seen whirling about for nearly a fortnight. Leaving *this* gloomy and soul-depressing locality we proceeded for about half a mile further down the river, and visited that frightful chasm called Devil's Hole, or Bloody Run. The former name it takes from a horrible deed of fiendish and savage ferocity that was committed there by the Indians, and the latter name from the circumstance of that deed causing a stream of human blood to run through the ravine and mingle with the fierce water of the Rapids. Exactly one hundred years ago, during the French and Canadian wars, a party of 250 officers, men, women, and children, were retreating from Fort Schlosser, on the Upper Niagara River, and being decoyed into an ambush, were driven over into this dreadful chasm, and fell to the bottom, a distance of nearly 200 feet. Only two escaped. A drummer was caught by one of the trees growing on the side of the precipice, and the other, a soldier named Stedman, escaped during the conflict, at the commencement of the treacherous onslaught. He was mounted, and the Indians surrounding him, seized the bridle, and were attempting to drag him off his horse; but, cutting the reins, and giving his charger the "rowels deep," the animal dashed forward, and carried him back in safety to Fort Schlosser. The Indians afterwards gave him all the land he encircled in his flight, and he took up his abode among them. In after years he put the goats on Goat Island—hence its name—by dropping carefully down the middle of the upper stream in a boat. After landing the goats he returned to the main land, pushing his boat up the stream where the Rapids divide, until he reached safe water. The events of the foregoing episode occurred in 1765, and it is to be hoped that the Indians were the chief instigators and perpetrators of the massacre of Bloody Run.

While we were looking about the chasm to see if there were any fossil remains in the place, an unlooked-for incident occurred. I saw two men coming up from the bottom of the ravine carrying *fish*—and the oddest fish, and the whitest fish I ever saw. The idea of anyone fishing in those headlong rapids had never occurred to us, but probably these men knew some *fissures* in the rocks where the waters were quiet, and where the fish put into, as a place of refuge, from the stormy waters into which they had been drawn. No wonder the poor finny creatures were white, for I should think they had been frightened almost out of their lives before they were seized by their captors. I don't think I should have liked to have partaken of the meal they furnished, for they were very "shy-an'hide" looking fishes. But soon we were obliged to give up both our geological studies and piscatorial speculations, for black clouds were gathering over head, shutting off the light, and making the dark ravine too gloomy to induce us to prolong our stay in that fearful chasm, with its melancholy associations of dark deeds of bloodshed and wholesale murder. Before we gained the road the rain came down, the lightning flashed, and the thunder clapped, reverberating, sharp and loud, from the rocks above; and we hurried away from the dismal place. On reaching the landing-stage we took refuge from the storm and rain by again going on board the "Maid of the Mist." She soon started on her last trip for the day, and we reached our hotel, glad to get out of a "positive bath," and indulge in a "toning mixture" of alcohol, sugar, and *warm* water. We had no "*gold*," but our "paper" being *good*, we did not require any.

After a delightful sojourn of three weeks at the Falls, and visiting many other places of minor interest in their neighbourhood, I bade adieu to the kind friends I had made and met, with many pleasant recollections of their kindness, and a never-to-be-forgotten remembrance of the charms and beauties, mysteries and majesty, power and grandeur, and terror and sublimity of Niagara.

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LANDSCAPE PHOTOGRAPHS.

New hands who go into photography ask,—What is a good process? Having both succeeded and failed again and again, may it permitted to me to say what appears to be the best, or at least a very good mode of proceeding.

1. To clean a plate:—Sulphuric acid one ounce; bichromate of potash one ounce; water one pint. Soak the plates in a tray, containing this solution, for some time; wash and dry with a cloth. When dry, take a tuft of cotton wool, and after pouring a little collodion on the plate, rub it with the tuft of wool over the whole plate, and then clean off with a linen cloth.

This seems to give a clean plate easier and more unfailingly than any process I have tried. I make no new suggestion, but only say what I have found to answer most easily and well, though suggested by others.

2. Any good bromized collodion will do in order to cover the plate, and let it fix before it goes into the bath. Sensitize in a 55-grain nitrate of silver bath, and let the plate remain in the bath ten minutes. Remove the plate into a well-bath of distilled water, and there let it remain until what is termed "the greasy" marks are gone. Then put for half a minute, or a minute, into a well-bath of a solution of eight grains of bromide of ammonium to the ounce of water, and place for a short time in another bath of distilled water. This bromide bath was, I believe, the suggestion of the late Mr. Glover; and it is invaluable. It enables a sensitized plate to be obtained without difficulty, which does not discolour. A 15-grain tannin solution is now poured over it. If this is done, the plate may be set up to dry, and is ready for exposure. Plate after plate may thus be rapidly prepared. After exposure (it may be for 10 to 15 minutes for dark scenery,) develop as Mr. Hughes has so clearly explained. C. C.

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PHOTOGRAPHY ON PAINTERS' CANVAS, BY MEANS OF THE SOLAR CAMERA.

BY CHARLES WALDACK.

[A description of Mr. Waldack's method of enlarging on canvas appeared in our pages about twelve months ago, but the process has received modification since that time, and Mr. Waldack sends us early proof sheets of the article as prepared for a new edition, now in the press, of his excellent "Treatise on Photography." In a letter referring to the process he makes the following observations.—"The process as described in the copy I now send you is as easy to practise and as certain in its results as the collodion process. I make a large number of these pictures, from fifty to a hundred a month, and I never fail, unless it be by a mistake in the exposure. Mr. Liebert, I see, publishes a canvas process in which the canvas is coated with chlorized gelatine and sensitized with ammonia-nitrate of silver. This I tried years ago, but gave it up because I found it too slow. By the developing process I use, I could, if necessary, make 20 pictures a day, and have done so, the canvas being prepared before-hand, whereas, by dry printing, one could not make more than two or three. On the other hand I can use all kinds of negatives, although a thin and transparent one is best, whereas for dry printing it takes a negative made expressly for the purpose. To make a canvas print from a *carte de visite negative* by means of the dry process is impossible; by the wet process, on the contrary, it is a very easy task.

"Another objection to the process as described by Mr. Liebert:—It is impossible to apply the silver solution by means of a brush or a tuft of cotton without rubbing the gelatine off. To conclude this subject, I will state that canvas prints made by the method described, are, in every respect as good as prints made on paper by similar methods."]

Ever since enlarged prints on paper were made, it has been the aim of photographers, who practise this branch of the art, to produce similar pictures on the canvas used by painters. The first attempts consisted in salting and silvering the canvas in the same way as the paper; but the coating of white lead with which the canvas is covered, not being a porous substance, the prints obtained were very faint. A modification of the glass albumen process was then tried. The canvas was washed with an alkali, coated with iodized albumen, silvered, developed with gallic acid, and fixed with hyposulphite. This gave from the start beautiful results, but the process was soon given up, on account of the peeling and cracking of the film of albumen after the photograph had been painted. The writer of this, who was then, and is now, engaged in the enlarging business, substituted a thin solution of gelatine to the albumen, and met with such success that he has continued to use the process ever since. It may be thought that the gelatine, like the albumen, leaving a film on the surface of the canvas, the image is also liable to peel off and crack, but this is not the case. For, while the film of albumen is horny and like parchment, and consequently adheres but imperfectly, the gelatine film is very porous and adherent, and leaves the canvas nearly in the same state as it was before. It is this process which we now propose to describe; we will divide it as follows:—

1. Repainting the canvas.—2. Cleaning.—3. Iodizing.—4. Sensitizing.—5. Exposure—6 Developing.—7. Fixing and washing.

REPAINTING THE CANVAS.

Different kinds of canvas give different results. Some kinds are easily cleaned by rubbing with a piece of canton-flannel, moistened with alcohol; others require rubbing with a sponge and soap water, to which an alkali has been added. One variety requires a longer exposure than another, and almost every sample gives a picture different in appearance. To work with uniformity, and produce the best results, it is thus advisable to give to the canvas a coat of paint always prepared in a uniform way. The paint we have found to answer the best, is made with one pound of white lead, ground with oil, and eight fluid ounces of turpentine, or common petroleum benzine. (The refined petroleum benzine and that made from coal or coal-tar is too volatile.) The white lead is the best kind used for common purposes, and is sold in kegs. The white lead and turpentine are well mixed, and the mixture is strained through a coarse cloth, and applied with a flat varnish brush. After two or three days, the paint is perfectly dry, and the canvas is ready for the next operation.

CLEANING OF THE CANVAS.

The canvas is now rubbed with a piece of canton-flannel moistened with alcohol. The object of this is to take off the greasiness, so that the iodizing solution adheres to the surface. The rubbing should be done gently, so that the paint does not come off. It is sufficient to go over the surface two or three times, after which, the canvas is rubbed dry with a new piece of flannel.

IODIZING THE CANVAS.

The iodizing solution is prepared according to one of the two following formulæ:—

Gelatine	... 200 grains
Iodide of potassium ...	... 400 „
Bromide of potassium	... 100 „
Chloride of ammonium	... 100 „
Water	... 80 ounces.

Glatine	... 200 grains.
Iodide of potassium ...	... 400 „
Bromide of potassium	... 200 „
Water	... 80 ounces.

The first solution is used when the negative is thin, and the second when it is intense.

The gelatine is soaked in the water until it is well softened. It is then dissolved by a gentle application of heat, the other ingredients are added, and it is filtered through a tuft of cotton-wool previously moistened with alcohol.

The iodizing solution is applied by means of a flat brush, and the canvas set to dry in a warm room, free from dust. If the coating should dry in lines, the fault lays in the cleaning. It should then be washed off with warm water, and cleaned again,

SENSITIZING THE CANVAS.

The silver solution is prepared according to the following formula:—

Nitrate of silver ...	... 1 ounce.
Distilled water ...	... 16 ounces.
Acetic acid No. 8 ...	... 2 ounces.

Old collodion silver solutions reduced to the proper strength, and additioned with acetic acid, can be used up very economically in this process.

The silver solution cannot be applied with cotton, for the thin film of gelatine would rub off. The way to proceed is as follows:—Get a square frame made of walnut, one inch thick, two and a half inches high, and the size of the canvas. Give it several coats of shellac dissolved in alcohol. Then take india-rubber tubing, one-half inch thick, pass it through a hot mixture of wax and turpentine, let dry, and tack it around the frame with thin nails about one-half inch long, driving the nails through the outer surface of the tube, so that the silver solution cannot come in contact with the iron. The canvas is now laid on the tubing, and is fastened to the frame by means of wooden clamps. The whole thus forms a tray, of which the canvas is the bottom, and which is kept from leaking by the tubing.

To sensitize the canvas, tilt it up to an angle of forty-five degrees, pour the solution in the lower part of the tray, and, by bringing this back to a horizontal position, cause the fluid to flow over the surface. Keep in motion by moving one end of the tray up and down for three or four minutes, and then pour into a bottle. The canvas is now ready for exposure.

The silver solution should be used but once, for it becomes contaminated by the gelatine, and would give foggy pictures. It is best to precipitate it with copper or salt, without waiting till it becomes discoloured.

EXPOSURE.

The focus should have been taken previously to the sensitizing. The canvas is then put in the same place on the stand or easel which it occupied before, and the sun is turned on.

The time of exposure varies considerably. It depends on the strength of the light, the intensity of the negative, the proportion of the enlargement, and the formula used for iodizing. The formula, without chloride of ammonium, produces the most sensitive surface, and is, consequently, better suited for intense negatives. The exposure should generally be continued until the image is partly visible. When the negative is intense, it will have to be quite plainly marked, but when it is very weak, it may be necessary to proceed with the development before the least trace of an image can be seen. When negatives are made on purpose for this kind of work, they should be made clear and transparent in the shadows, and without density in the high lights. Such negatives will, with the first formula for iodizing, give the best prints.

How long the exposure will have to be, is, as can be concluded, entirely a matter of judgment, guided by experience. We have made canvas pictures in five seconds, and at other times have been obliged to expose eight and ten minutes.

DEVELOPMENT OF THE IMAGE.

The image is developed with a solution of gallic acid, slightly acidulated with acetic acid. The strength of this solution varies according to the temperature. In warm weather, the saturated solution, diluted with twice its bulk of water, will answer. In cold weather, it may be used twice as strong. Very little difficulty will be found in this part of the manipulation, for if a weak solution is used, the only trouble is that the image will come out slowly.

The gallic acid solution is flowed over the surface of the canvas in the same way as the silver solution.

If the development proceeds too slowly, from under exposure, or any other cause, it can be activated by adding a little silver solution and a few drops of a solution of acetate of ammonia, or acetate of soda.

When the image is fully brought out, further development should be stopped, by adding a few drachms of a solution of common salt. The canvas is then rinsed, and is ready for the next operation.

FIXING AND WASHING.

The fixing is done with the ordinary solution of eight ounces of hyposulphite of soda in one quart of water. It is advisable to perform this operation after the canvas is taken off the frame, for if any hyposulphite remained on the wood, or got in the tubing, the next attempt would result in a failure, the canvas becoming entirely black on applying the developer. The hyposulphite solution is poured over the surface, and flowed forward and backward, after which the picture is washed under a tap for five or ten minutes.

OBSERVATIONS.

After a picture has been made, the frame is washed by means of a sponge, with soap-water, to which a little cyanide of potassium has been added. It is then rinsed in an abundance of water and set to dry.

A canvas which has been used is also cleaned with soap-water and cyanide. It will generally have to be painted over again, for the cyanide solution will take off part of the paint.

The quantity of silver solution to be used for a twenty-nine by thirty-six picture can, by skilful manipulation, be reduced to eight or ten ounces. The silver can be precipitated out of this solution by copper or salt, and afterward transformed again into nitrate.

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MR. SIMPSON'S NEW PRINTING PROCESS.

[Our readers will have pleasure in reading the following remarks, which occur in a leader in the last number of the *Journal of the Photographic Society*, on our new process, and the reception it met with at a meeting of the Society.—Ed.]

The enunciation of a new principle in photography is an event of somewhat rare occurrence. It was not surprising, therefore, that the reading of Mr. Wharton Simpson's paper "On a New Method of Printing, and the Preparation and Use of Collodio-chloride of Silver," produced an amount of interest at the last meeting of the Society with which the members have been for a long time unfamiliar. The principle which underlies the process (the possibility of suspending chloride of silver in collodion in such a fine state of subdivision as to constitute something very nearly resembling a solution), was, in itself, a chemical fact so unexpected as to excite the surprize of everyone—the chairman's remark of surprise, interrupting the speaker when he enunciated the fact, being the common expression of the feeling of every member present. The application of this discovery had been in every respect as successful as the fact was novel. As specimen after specimen of portraiture and landscape, illustrating every phase of photographic excellence, and every variety of tone, was exhibited, the surprize of the members fairly gave way to admiration, and found its expression in the applause which greeted Mr. Mayall's remark that he had not seen before, by any process, such a print as that he held in his hand, which rather resembled a proof from a fine engraving by Cousins than an ordinary photograph.

The simplicity of the process was, moreover, as might have been expected, a common theme of admiration, and the gratification of members on the discovery of a process of printing so perfect in principle, so simple in practice, and so successful in result, was in no measure damped by any consideration as to patent restrictions or personal monopoly,—the applause elicited by Mr. Robinson's allusion to patents was a sufficient index to the feeling of the meeting on this subject,—the process being announced as presented to photographers at large as common property, unfettered by restrictions of any kind. The late hour at which the meeting was held—immediately preceding our going to press—prevents us entering into detailed comment on the process itself, or on the pictures exhibited; and we, therefore, simply content ourselves, for the present, with congratulating our readers on the discovery, and on the fact of the Photographic Society of London having been, as indeed it ought to be, the medium for placing before the world, for the first time, a distinctly new method of printing, illustrated with examples which, even in the infancy of the process, compare favourably with the best specimens of printing by methods perfected by the experience of many years.

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ON THE PRODUCTION OF SCARLET NEGATIVES.

BY M. CAREY LEA.*

The extreme opacity of a strong red colour to the actinic rays of light, renders it peculiarly adapted for negatives. Images of this colour may be obtained in the following easy manner.

After fixing and washing the negative in the usual way, it is first to be iodized to a bright yellow colour. This may be effected in any convenient manner. It may be simply placed in a bath of iodine dissolved in water, or in a solution of iodine in alkaline iodide; or tincture of iodine may be poured over it. This latter method I have tried with advantage, and have since seen that it was first proposed by the Editor of this Journal. Or the negative may first be treated with bichloride of mercury, and subsequently with iodine solution, or both may be applied together in the form of a solution of corrosive sublimate in iodide of potassium.

Any of these well-known methods may be used to produce the iodide. The conversion of the yellow picture to scarlet is effected by Schlippe's salt, the sulphantimoniate of soda. A tolerably strong solution of this substance is poured over the plate, and moved backwards and forwards till its action is uniform. The colour produced varies slightly in shade; when the operation has been properly performed, a brilliant scarlet colour is obtained.

The red colouring matter which gives the scarlet tint to the picture is probably the sulphantimoniate of silver, a substance of sufficient permanency to justify its employment, especially as it is to be further protected by varnish. The instability of the mercury compounds now so generally used for strengthening negatives, is a strong argument against their use and in favour of the substitution of anything that promises greater permanency.

The scarlet image thus obtained may be again modified by new treatment. An ammoniacal solution of nitrate of silver brings it from a scarlet to a purple colour. This I mention merely as a matter of curiosity, the advantage being manifestly in favour of the first colour.

While on the subject of strengthening negatives, I may refer to one or two points on which information might be advantageously elicited. The most opposite opinions are entertained with respect to the comparative permanency of the methods now in use. Mr. Lamb, in a communication to Sutton's *Notes* (1861), mentions that he had been for a long time in the habit of using bichloride of mercury followed by iodine, but that every negative so forced had faded in two or three years. Bichloride of mercury followed by alkaline sulphide is largely used, and gives very strong pictures, but a professional photographer who makes a speciality of copying, and forces most of his negatives, informed me that he had abandoned that treatment, in consequence of the instability of the picture. No one who works carefully wishes to make negatives of doubtful permanence, and as copies of pictures and engravings, instantaneous views, &c., must often be strengthened, the question as to what is the best means of forcing is one of very great importance. Correct information from those who have old negatives which have been created in the various ways referred to, would be valuable and would aid in building up a firm foundation of knowledge in this branch of photography.

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* From the *American Journal of Photography*.

With respect to the process which I have here described, and which I believe to be entirely new, one or two remarks remain to be made. Schlippe's salt, the use of which I propose to introduce, has the representation of being extremely unstable. Although this has nothing to do with the picture produced by it, inasmuch as the salt undergoes decomposition in forming it, it is nevertheless of interest in connection with its use. The Schlippe's salt which I have been lately using, I made myself some *ten years* ago, in order to study its very interesting crystalline forms, and I then ascertained that its stability might be greatly increased by the use of a somewhat larger proportion of caustic soda in preparing it, than that directed by the formula of Liebig. No better proof of this is required than the fact that what I prepared in this manner, after remaining for ten years in a bottle not a quarter full, and merely corked, not sealed, is still good.

As Schlippe's salt is not everywhere to be had, and as many photographers may desire to prepare it for themselves, I give the following directions, based upon the conclusions just referred to.

Place in a closed vessel the following mixture, viz.:—

Grey sulphide of antimony ...	22	parts
Crystallized carbonate of soda ...	44	„
Well-burnt lime	17	„
Water	48	„
Flowers of sulphur	4	„

The lime is slaked with the water, and the whole is then mixed in the vessel, 140 more parts of water added; a large bottle is best, corked, and well shaken from time to time. At the end of twenty-four hours it is filtered, water poured on the filter, to carry the soluble parts through, and the filtrate is evaporated to the crystallizing point. An abundant crop of large lemon-yellow crystals of beautiful forms (regular tetrahedral), is obtained. These should be dried and secured in a well closed bottle. They are less permanent in solution, a ten per cent, solution will, however, keep for some days; in proportion as the solution is weaker, it becomes less stable. When very dilute it soon lets fall a reddish powder. This is an objection to its use in a dilute form as a bath which, nevertheless, in other respects, is preferable. The solution should be kept for a few minutes on the plate. As the materials for producing this substance are inexpensive, and the manipulation of the easiest kind, it could be produced commercially in case of an extended demand at a price scarcely exceeding that of hyposulphite of soda.

It has occurred to me from observing the effect of some negatives made in this way, when viewed as positives, that a treatment of this kind might be found to produce an agreeable effect in giving a warm tint to ambrotypes. I have not, however, made any experiments in that direction, and merely throw out the suggestion.

The final tint which the negative has, when treated in this manner, appears to depend very much on the extent to which the previous iodizing has been carried. If the application of iodine has been but for a short time, the resulting negative after treatment with Schlippe's salt, will be of a beautiful russet brown, a shade unlike anything that I have seen in photography. As the extent of the iodizing increases, so will the warmth of the resulting tint at the end of the work. With a nearly sufficient continuance, an orange colour is produced; but when the iodization is complete, a full scarlet results. The orange colour I like less than either the scarlet or the russet brown, and I am inclined to believe it at present less impervious to light than either of those shades.

It seems almost superfluous to remark that to apply this treatment to a negative already nearly strong enough—especially to a view negative, would be to commit a gross error. The result is, that the lightest half-tints become too thick and print white, giving that snowy effect which is so repulsive.

Its use, like other strong modes of forcing, must be reserved for bringing up very thin negatives, or for strengthening engravings in which it is desired to keep the lights absolutely white, even through a long exposure, and like other powerful methods, great care must be taken that it does not block up the most delicate lines.

In preparing Schlippe's salt, the process may be very much expedited by heat. The materials may be placed in a large flask and boiled together for two or three hours. The test of the completion of the operation, whether heat is used or not, is that the grey insoluble powder at the bottom, becomes white.

The keeping properties of a solution of Schlippe's salt may be greatly increased by rendering it alkaline, for example, with a few drops of ammonia. But the brilliancy of the colour produced is thereby greatly impaired. So, too, the mother water from which the Schlippe's salt has crystallized out, may be used. This produces a sort of deep red-black picture very opaque to the active rays. In fact, it has occurred to me latterly that when it is merely wanted to produce an effectual strengthener, and a scarlet colour is not especially sought for, it is scarcely necessary to crystallize the salt. This materially simplifies the operation. The ingredients already mentioned might simply be placed together in a large bottle, and set aside for a day or two until the whiteness of the insoluble portions indicates that the whole of the grey sulphide had been decomposed. It then might be simply filtered and placed aside for use. This liquid would doubtless keep well. I have not tried it, but as the mother water after crystallization does it can scarcely be doubtful but that this would also. I must repeat, however, that if a scarlet colour is desired, the crystallized Schlippe's salt must be employed.

I directed in the foregoing part of this paper, to flow the plate with the solution of the salt. But I latterly prefer to use a rather weaker solution, or to drop the plate into a sufficient quantity to cover it, placed in a porcelain dish.

It is now fifteen months since I first found and used this method, and the negatives then made are still in excellent condition, so that, as far as experience has gone, it is in favour of their permanency. As, however, I have had little time for printing, none of my negatives have been exposed much to the sun, and I cannot, therefore, speak positively of its effects. Generally, however, the sun does not injure strengthened pictures.

There exists various compounds of a nature analogous to Schlippe's salt which would doubtless produce results very similar to it. The sulphantimonite of sodium, for example, would probably afford a very similar colouration. So, too, the various compounds of arsenic, sulphur, and alkali, alkaline hyposulpharsenite, sulpharsenite, and sulpharseniate. The reactions of these substances were not examined, as there seemed no reason for expecting better results from them than from the sulphantimoniate, which is more easily prepared and less poisonous.

In conclusion, I may remark that while a proper proportion of caustic soda is essential to the stability of the salt, an excess would be likely to be very injurious: the proportions I have given may be used with advantage. Red stains on the hands and on vessels occasioned by the use of this substance, are easily removeable with weak caustic alkali.

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DEVELOPING PROCESS.

BY REV. S. MILLER.

THE essential qualities of a good negative I take to be clearness of detail combined with good intensity. It remains still a problem, what is the best and most reliable process to produce this combination.

To produce them in a single process of development is obtained only in exceptional cases; and then the credit for the result is generally claimed in favour of a supposed superior quality in the collodion, or in some other preceding conditions, rather than to any peculiarity in the process of development. Hence the general photographic mind has gone out on a chase after the best kinds of collodion, &c., hoping to find in them the standard means of producing uniformly the good qualities referred to; but it turned out pretty much of a wild goose chase after all.

One kind of collodion is found to be about as good as another for the purpose for which collodion is intended—not even the best will uniformly produce *the* results referred to. I am inclined to think that the solution to the problem will be found, nearer home, in an improvement in the process of development rather than in anything else. This, I am inclined to think, is the direction to which our next inquiries on this subject should be directed. What we really want is simply a *process of development* that will at once and uniformly produce the two essential qualities of a good negative—clearness of detail combined with good intensity.

As the subject of intensifying negatives has of late received the renewed attention of operators and writers on photography, I may be allowed to give my experience with an old and almost-forgotten process, to which I would direct the attention of others.

It is well-known, at least among old operators, that extraordinary intensity is produced by pouring over the plate, after developing and before washing it, a solution of nitrate of silver. But this mode of intensifying negatives found little favour, and was soon abandoned on account of the irregular action of the silver and the consequent blotches produced on the negative, caused by the greasiness on the plate. To prevent this, it was deemed necessary to wash the plate before the silver was applied; but this was done at the expense of a proper degree of intensity. Or, the silver was applied in connection with the iron developer; but the resulting intensity was then at the expense of clearness in detail. Neither of them combined the two essential qualities of a good negative. Hence it was deemed necessary to resort to other means to increase the intensity in the one case, or to clear the picture in the other—pretty much of a wild goose chase again.

Against all these extrinsic helps more or less serious objections have been raised, and it still remains an open question—what is the best and most reliable process of developing a picture, that combines the essential qualities of a good negative?

I do not pretend to have solved this important problem, but would direct attention to its importance, and I simply give the result of my experience as pointing in the direction where the solution may be found, namely, in an improvement of our process of developing negatives.

After trying and experimenting on all the various methods that I deemed worthy of a trial, with good, bad, and indifferent results, none of which, however, gave full satisfaction, I was induced to return to the first process above alluded to, with a view to surmount the irregular action of the nitrate of silver and its consequences, and thus turn to account the great intensity which it is capable of producing.

After repeated trials I succeeded in this, and found, to my surprise, that both the essential qualities of a good negative were combined, produced by two distinct actions in a single process. It is very simple, and, on account of its simplicity, no doubt it was overlooked by the fathers of photography, who taught us the necessity of washing the plate well before we apply the silver solution. Proceed as follows:—

After exposure, pour the usual iron developer on the plate, and watch the picture until it is nearly, but not quite sufficiently developed. Leave the iron solution on the plate, which should cover well the entire surface. Now pour on a diluted solution of silver, and as quickly as possible an additional quantity of the iron solution, and wave the plate (so that both solutions mix properly) until the development is completed. Then wash and fix in the usual way. A few trials may be required to become expert in the manipulation. If done properly no greasiness will appear on the plate, and the action will be uniform. The result is a clearly defined picture with great intensity. It is apt to be rather too intense than otherwise.

It will be observed that the result is produced by two distinct actions in the process, and that hence neither of the two essential qualities is produced at the expense of each other. The clearness in detail is secured in the first part of the process by the action of the iron solution alone, and the intensity is produced in the latter part by the addition of the silver solution after the details have been developed. Hence the result combines both, and can be produced in any desirable relation by modifying the several distinct actions in the process.

It is true that the developer I have used in these experiments differs from the ordinary iron solution; but it is presumed that any good iron developer will produce the same results. So also with regard to the collodion. Any kind that will give a well-defined picture will answer the purpose, and there is no need of going on a wild goose chase after a very particular kind, that possesses a magic quality to produce good negatives.

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* From *Humphrey's Journal*.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 22th March, 1865.

THE last meeting of our Photographic Society despatched its business in a very brief space of time, consequently its record must be brief also. Mr. Lœwe addressed a communication on a process of photographic engraving of which he is the inventor. "The process," he says, "rests upon the following principle. Of all metals, gold is the one that best resists acids, consequently, a picture in gold possesses all the qualities necessary to resist the influence of such agents. I propose, therefore, to form a picture in gold, transferable to metal, after having given to the latter a coating which renders the picture adherent. I operate in the following manner:—

"I take a clean piece of silk, and first immerse it in a solution of gum tragacanth and gluten. Leaving it till it becomes dry, I calendar it, and then coat it with caoutchouc dissolved in benzine. After spreading it upon a piece of glass and fixing it in a pressure frame, I leave it dry. By this arrangement the back of the silk is henceforth protected from moisture.

"I next sensitize by means of per-chloride of iron and tartaric acid, and expose in the usual manner; and, lastly, I develop by dusting it with the following mixture in fine powder:—

Sel d'or	2 parts
Pure gold	3 parts

"At this moment I direct a current of hydrogen into the dish with the intention of metallizing the proof. This result obtained, I detach the silk, which possesses a smooth and polished surface, "On the other hand, after thoroughly cleaning a copper plate, I cover it with the following mixture:—

Chloride of zinc, concentrated.
Carbonate of ammonia.
Borax
Gum.

"When this coating begins to dry, and becomes sticky, I apply the pictured side of the silk to it, give a gentle pressure, and leave it to dry.

"Upon afterwards rubbing the back of the silk with a moist sponge, I detach it from the picture, which remains fixed to the metal. I then direct upon the plate the flame of a soldering blowpipe, and afterwards expose it in a solar camera, allowing the light of the sun to strike upon the entire surface of the plate, which is thus damasquined in gold soldered upon copper.

"I next engrave upon the plate with a solution of nitrate of silver, 10 per 100, which possesses the advantage of not corroding beneath the picture. Care must be taken to wash the plate every time that a portion of the solution removes a fresh film of copper."

It was impossible in the absence of specimens to estimate the value of Mr. Lœwe's process.

Mr. Mante presented some specimens of heliographic engraving in mezzotint and in relief, obtained by means of bichromated gelatine, then moulded and reproduced by the electrotype process, according to M. Poitevin's process of *helioplastics*.

Mr. Marêchal junr., of Metz, presented in his own name and in the name of M. Tessie du Motay, his associate, a collection of vitrified photographic proofs and photo-lithographic proofs of remarkable excellence, which, viewed as transparencies, appear like stained glass. As the process is being patented a description is deferred.

We have now entered upon the spring quarter, but with a temperature as rigorous as that of midwinter. With the thermometer below zero (C), photographic operations must be very limited indeed. Such a winter as we have passed through must be taken as altogether exceptional, in which view the photographer finds his consolation, though not without some misgivings as to what the coming summer may be. Should it prove as bad as many of its predecessors, ruin to many enterprising photographers is imminent.

PANTASCOPIC CAMERA.

Sir,—I am sorry to find that your correspondent "Architection," in his letter considers that personalities have been introduced into the correspondence between Mr. Johnston and myself. For my own part, I was not aware of it on either side; but if any word bearing such an interpretation has crept into my letter, I can only say it has been perfectly unintentional, and I beg that it may be considered as unwritten, for no one has a greater contempt than I have for the introduction of personalities into a discussion of a purely scientific character. In justice to myself I ask the insertion of these lines in your journal.—I am, sir, your obedient servant, P. Le Neve Foster.

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Photographic Notes and Queries.

Mr. Bartholomew's Dry Process.

Sir,—Would you be so good as to allow me space in your columns for the following questions, as I am in want of sure information relative to Mr. Bartholomew's dry process, and which I hope that gentleman will kindly afford me? viz.:—Can an iron-developer be used; and, if so, what is its formula?

2. Supposing the previous question be answered in the affirmative; does a plate require a shorter exposure than for the pyrogallic developer, the conditions as to light, lens, &c., being the same; and is the results as good?

3. What is the formula for the morphine bath; and does its use render the plate more sensitive?

I have used this dry process for some time, and like it so much, from its simplicity and certainty that, I wish to learn all I can. I am now making some experiments as to the keeping qualities of the plates; the results I shall be glad to communicate if you should consider them worth inserting.—I am, sir, your obedient servant, T.

Chatham, March 10*th*.

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Talk in the Studio.

The Diamond Cameo Portraits.—If any instance were wanting to prove that the palmy days of photography are not at an end, it might be found in the astonishing success which these new pictures have met with. The first notice of them appeared in these pages in October last, as soon as due registration was completed; and during the four months which have elapsed since that date, comprising only the dullest season of the very worst photographic winter known for years, the inventors have issued upwards of seventeen thousand copies, and have been honoured by the highest commendation from the most exalted quarters. There can be no doubt that the style is becoming extremely popular, especially in the best circles; and deservedly so, for it would be difficult to find anything more agreeable or pretty than this "photosculpture of the album," as the style has been designated. Photographers also appear to be by no means backward in appreciating so good a thing. Already about four hundred thousand licence cards for the process have, we understand, been disposed of in this country; while the style is being worked in France, Belgium, and in some parts of Germany.

Portraits of Mr. Fenton.—The name of Roger Fenton is familiar to almost all photographers, as one of the earliest and most successful votaries of the art, and the first Secretary of the Photographic Society. Mr. John Eastham, of Manchester, has just produced and published, four card photographs of him, which are excellent examples of photography, and capital portraits.

Destruction of Magnesium Wire Works.—We learn from the Manchester papers that on Tuesday a building in connection with the works of the Magnesium Wire Works company, in Salford, was totally destroyed by fire. Before the arrival of the fire engine and men on the spot, the building had become a mass of ruins. Nothing is at present known of the origin of the fire; but the damage is believed to be considerable. How far this will interfere with the supply of the wire we have not heard.

Carbon Prints.—We have just received from Mr. Swan a magnificent carbon print, from a negative 15 by 12, of very rich warm black tone, and perfect in all respects. The same case contains a very beautiful print on opal glass, apparently in carbon; but we have no instructions at present regarding them. We are glad, however, to find that Mr. Swan has been steadily making progress, of which we shall learn details in good time.

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To Correspondents.

Young Photo.—Houses at fifteen feet distance of each side of your glass house, and having a much greater height, would interfere materially with your light. If you can change your position and arrange that one side shall face the open light of the north, it will be a great improvement. Each end of your room should be opaque, and the proximity of the houses to each end will not be a disadvantage. 2. We recommend the possession of more glass than is generally absolutely required for work, for two reasons; first, because it is often valuable in very dull weather; and second, because with blinds it is possible to stop out all the light not required, but to stop it out from any part where circumstances may make it desirable, whereas with a limited amount of light you have very little facility for varying its direction. 3. A working plan for a glass house must be suited to the circumstances of each case: the Year-Book for 1864 gives several designs for different forms of glass houses, but no working plan. Write to Mr. H. P. Robinson, describing your position, and he will supply you with plan and instructions. 4. We prefer the longest focus of the two, as giving the best results with the shortest exposure.

S. G. Payne.—Thanks. The effect is very cleverly secured. We shall have pleasure in seeing the other specimens to which you refer, and to hear any details. We shall have something to say on the subject next week.

H. Dixon.—There are two or three dangers in cleaning a Daguerreotype which require experience to avoid. In the first place, it is sometimes difficult to get an aqueous solution to flow evenly, without being repelled as from a greasy surface, over the tarnished plate. Next there is at times danger of partially dissolving the picture. And, finally, there is danger of stains in drying. None of these dangers are of much importance in experienced hands. We have restored many scores of Daguerreotypes without ever injuring one, but it is because we know these dangers may arise with the inexperienced that we point them out. Try your hand first on an old and valueless Daguerreotype, and then you may, with less hesitation, operate on one which is valuable.

Robeat Cade.—The poisonous action of cyanide of potassium is generally too rapid and violent to admit of a remedy. The best remedy is fortunately one which the photographer has generally at hand; it consists in the application of a weak solution of protosulphate of iron, which will convert the cyanide into prussian blue. The application of cold water to the head and spine may be useful, and the employment of the stomach pump. But after the administration of the iron solution and the application of cold water, a medical man should be called in without loss of time. We shall probably have more to say on the subject shortly.

T. Hollann.—The first thing you should do is to ascertain if the sensitive plate occupies accurately the same plane as the ground-glass. If it be wrong, that may account for your want of sharpness; and if it be right, it is probable that the visual and actinic foci of the lens are not coincident. To ascertain this, place a pile of 6 or 8 books on a table, one placed upon another, and each an inch further back than the preceding one, let the backs be towards the camera, and focus for the middle book in the pile, getting the lettering on the back sharp. Now take a picture, and observe the result. If the book upon which the focus was obtained be sharp, the lens is all right; but if this be out of focus and some other sharp, the actinic focus is not coincident with the visual focus. You must then, in focussing, always focus so much in front or behind the object, as the position of the focus on the books may suggest, or you may get the maker to change or improve the lens.

W. Fox.—The chief fault appears to arise from the use of a collodion which is slightly opaque or opalescent when dry. This gives the peculiar bloom and want of transparency in the blacks in the collodio-chloride prints you enclose. In the next place there is not quite sufficient free nitrate to give vigour. You will find the formula given in the paper in our last will give the best results. You will obtain both more vigour and richer tones by sufficient excess of free nitrate. We have obtained all kinds of tones and every degree of vigour. Thanks for the charming specimens you enclose. They are very fine.

F. W. Haatley.—Mr. Noel Fitch's address is 13, Union Street, Borough.

J. M.—If you had sent us an example of the imperfection which troubles you we could have helped you better. A dark shadow at the corners of the mouth is often the result of excess of top-light.

Henry V. Cholmondely.—The best results we have seen produced by any modification of the Fothergill process were prints by Captain Bonamy, by the method we published in our last volume of the News, and in our last Year-Book, in connection with Captain Bonamy's name. They are very delicate, brilliant, and clean, and the exposures moderate. 2. The collodions you name will probably answer well, but would perhaps be better for an extra proportion of bromide. 3. We prefer a glass-bath in wooden case, with water-tight top, for travelling. 4. Plate boxes of tin, with grooves of gutta-percha, are, we think, safest for dry plates. Those of deal are doubtful. We do not remember to have suffered any disadvantage from their use, but we have heard of others who have. The print enclosed would have been good with a little more exposure. It is also slightly suggestive of too free use of silver in the developing solution.

A. B. Collins.—In mixing two collodions by different makers it is quite possible that you may cause the formation of an insoluble salt, which, making the collodion turbid, will give spots until it is thoroughly settled. For instance, if you mix a collodion containing a good deal of bromide of cadmium, which is freely soluble, with one containing chiefly iodide of potassium, a portion of bromide of potassium will be formed, which is very insoluble, and hence turbidity would ensue. 2. The best plan in working collodion is to fill two pouring bottles from your stock in the morning, and use from these alternately during the day; empty them at night into a bottle kept for the purpose, and decant from the stock bottle sufficient for next day's use. The bottle of "bottoms" may be used for a variety of purposes. Sometimes a portion may be decanted from it which will work well; sometimes a portion added to new collodion will improve it. 3. Where a bath is much worked the plan of using two is found to answer well; but it is not necessary where the bath is not very much worked. 4. Do not replenish the bath so long as it works well until it gets too low to cover the plates.

G.—You have spoiled the physical qualities of the collodion, by adding too much water to it, and made it rotten and crapy. We do not know whether the preparation is sold anywhere. 2. The best mode of coating paper with collodion is first to turn the paper up about the eighth of an inch all round, then pin it to a deal board with a handle, allowing one corner to project over the edge of the board; and then coat as you would a plate of glass. 3. It will answer for stereographs admirably.

J. G.—Either good glue or starch answer well for mounting. It is a matter of taste which is best. Starch is always ready, and glue requires heating; professional mounters, however, use the glue. 2. A skilful photographer having a landscape negative with a somewhat thin sky may attach tracing paper to the back, and paint clouds thereon. It might be possible to attach a transferred collodion film with clouds to another negative.

Light and Shade.—For a bath of 50 ounces, 4 ounces of nitrate of silver will be sufficient. It is unnecessary to keep anything at the bottom of your stock-bottle of nitrate of solution. Oxide of silver, &c., are remedies for certain bad conditions, but they would be injurious to a bath in good order. 2. Try adding the pyroxyline at the rate of one grain to an ounce of your thin collodion, and then test it; if sufficient body is not attained add more. The collodion must stand a day or two after the addition, to settle. 3. The difficulty in getting an even film, and tendency to set in crapy lines is from the fault of the collodion, and may arise either from the quality of the pyroxyline or from the presence of water in the solvent. We do not know any cure for such condition in the collodion; sometimes the collodion may be worked off by mixing with a more perfect sample. 4. We do not like any window in the end of the room fronting the sitter. We are glad to hear of your progress, and will examine your specimens with pleasure.

P. S.—The best plan will be to throw it down, and recover the silver. It will be difficult to restore it.

T. S. S.—We do not know of any efficient method of staining calico of a non-actinic colour. A dyer will make it of an orange tint for you.

X. Y. Z.—Mr. Atkinson, of Liverpool, we believe, manufactures the ordinary solar camera, but we believe most of the dealers keep them in stock. We do not know the price. Where one enlargement only is required, it is more easily produced by means of the solar camera than by the plan of enlarging the negative. A room for the solar camera should have a window with a south aspect. The size of room depends on the focus of the enlarging lens used and the amount of amplification required; about fourteen feet from the window would probably answer. A suitable condenser will be supplied with the apparatus. Prints are obtained direct from the small negative by this apparatus. The best lens for the purpose is a No. 1 triple. Waste developing solutions, &c., may be added to the waste hypo, and the silver thrown down as a sulphide by means of liver of sulphur. A kitchen fire with good blast may be vented sufficiently to reduce chloride of silver, but unless you are familiar with such operations, you may risk failure. There is as much risk of loss from inexperience as from the dishonesty of refiners, many of whom are quite trustworthy. The same is true of the ashes. With a little attention you may doubtless, by following the instructions given in our pages, succeed in reducing your own waste, but you must be content, in such case, to purchase experience by a few failures. Unless you have a great deal to reduce, probably the most economical plan will be to send to a refiner.

C. W. H.—We have communicated with Mr. Gill. He will have pleasure in supplying copies of his "doubles" at one shilling each. His address is 43, Islip Street, Kentish Town Road. An illustrated article on the method of producing them will appear in our next.

Solaa.—A trough lined with the india-rubber of which you forward a sample, will answer for iodizing and bromizing solutions. Immersion is best. Distilled water is desirable.

W. H. Warnea.—The results you have obtained are most singular and very interesting. We have never met with anything of the kind. The best results we have obtained were by a collodio-chloride made as directed in our last paper, toned in a lime and gold bath, and fixed in hypo or sulphocyanide. We have found it possible to get almost every shade of brown and black in this way.

L. B., Newcastle.—There is nothing new in the use of opal glass for photography. It has been in use for many years. New methods of working on it and obtaining fine tones there may be, but the paragraph you enclose is simply a foolish puff.

E.—We have no certain information. About 40 cells of Grove's battery will yield a good light.

Georgius.—We have no knowledge of a preparation known as "novargent." We are not familiar with the mode of silvering copper to which you refer; but the instructions for it are as follows:—2 drachms each of common salt, and tartar, and half a drachm of alum are mixed with from 15 to 20 grains of metallic silver, in powder, precipitated from a solution of nitrate by means of copper. The copper is cleaned, then rubbed with this mixture and polished. 2. Boiling the bath will throw down the contamination, or rendering it alkaline and sunning will also throw it down. 3. It is difficult to apply nitrate of silver to ivory, as it is unequally absorbent. The best mode of photographic printing on ivory is by means of the Wothlytype process.

W. S.—The longer focus, if you have room enough in your glass house. It will be quite as rapid as the other, because you can work it with a larger aperture, and it will define the edges of the plate better. 2. We prefer the 5-inch focus for general purposes. 3. On removing the central lens from No. I triple you get a doublet of very short focus; you may get good vignettes with it on a small plate. But probably working it with full aperture without removing the negative lens will answer your purpose.

Stupin.—It is somewhat difficult to state where you are wrong without seeing your operations. Possibly, you have not sufficient flux, or do not incorporate it well with the silver salt. Rough pots will cause small beads of silver to cling to the surface, which are difficult to remove. It is quite possible to lose chloride of silver by evaporation, but if sufficient flux were incorporated with it, and the heat applied properly, it should be reduced into metallic silver without evaporation. The chloride should be mixed with the hydro-carbon, and reduced to a red hot powder of metallic silver; the flux should then be added and stirred up with it, and the heat raised a little, when the whole should become fluid and be poured off without loss.

Indian Letters.—Two letters from India, one from S. Corrigan, and one from C. Ricketts, were unfortunately mislaid. They shall receive attention in our next.

"Doubles, and How to do them," by H. P. Robinson, and several other articles in type are compelled to stand over for want of space.

Several correspondents in our next.

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Photographs Registered during the Past Week.

Messrs. G. and J. Hall, 26, Westgate, Wakefield,
Photograph of a Medical Case.
Mr. Georoe Hodoson, 13, Devonshire Street, Sheffield,
Photograph of William Fawcett, Esq.
Mr. John Budd, of Dunstable,
Three Photographs of Rev. A. Hardy.
Mr. H. Lambeat, 10, Fountain Buildings, Bath,
Photograph of Rev. G. E. Fate.
Photograph of Rev. W. E. James.
Messrs. Lucas, Brothers, 3, St. John's Wood Road,
Photograph of a Picture, "A Lucky Guess."
Mr. G. Gaeen, Ledbury, Herefordshire,
Photograph of John Cam Thackwell, Esq.
Mr. W. Guthaie, 23, Inn Street, Newcastle-on-Tyne,
Photograph of Mr. H. Hemming as Clown in the Pantomime of "Rumplestiltskin."
Mr. T. Bullock and Son, Macclesfield,
Four Photographs, Groups of Officers of Macclesfield Rifle Volunteers.
Mr. G. R. Gill, Islip Street, Kentish Town,
Photograph entitled, "Giving myself a Ride."
Messrs. Appleton and Co., Bradford,
Photograph of Rev. J. Burnell, L.L.D.
Mr. J. H. Kay. 57, Argyle Street, Glasgow,
Photograph of Rev. M. R. Glover, Glasgow.
Bullock Brothers, 20, Lower Parade, Leamington,
Photograph entitled "Good Tidings."

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 343.—*March* 31, 1865.

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DOUBLE, TRIPLE, AND MULTIFORM PORTRAITS, AND MASKS IN THE CAMERA.

Photography has generally been regarded as the most literal of the graphic arts, incapable of rendering anything but facts as they are, guiltless of anything like fancy, and antagonistic to imaginative art. It has indeed become a synonyme for literal minuteness in delineation or description: to describe a thing with detailed accuracy is, in common parlance, to photograph it. Photography has, however, its grotesque or bizarre phases, in which it deals at times with pictorial paradoxes, with which it puzzles, perplexes, even startles the uninitiated, by effecting seeming impossibilities. Such a phase has been exciting attention amongst photographers during the last few months, during which some singular portraits hitherto phrased "doubles" or binary portraits,—but which, from recent examples brought under our attention, will probably have to receive some such generic title as "multiform portraits,"—have gradually been getting into circulation.

The first description of these pictures in this country was given in our own pages at the latter end of last year, when we referred to a card-picture with two portraits of the same person in two different costumes, which, from the perfection of the joining, forbade the idea of double printing. Shortly afterwards Mr. G. R. Gill sent us some examples of a similar result, which, it appeared, he had been producing for some months, the idea with him being independent and original. He then sent us an account of his mode of effecting the dual portraiture, by a pair of simple shutters inside the camera. At the same moment we received the *American Journals* with accounts of similar pictures being produced in America, and a detailed description, by our esteemed confrere Professor Towler, of the modus operandi. Almost simultaneously with these we have received other examples, conceived, and the means of producing them devised, independently and spontaneously, by various other persons. The conceit is so odd, and the possibility so unexpected, that one might very easily take refuge in the notion that some tricksy spirit, some whimsical elf amongst the genii of photography had, for a season, obtained especial power, and flitting over the eastern and western worlds, had inspired certain photographers in each to indulge simultaneously in this singular freak of the art. One photographer appears to have been so struck with the novelty of his conception, that he has rushed to the patent office to protect it, and we find registered amongst the most recent provisional specifications, one for a method of taking "binographs."

At first sight these pictures may present to many persons merely an amusing form of portraiture; grotesque, but nothing more. If this were the only interest they possessed they are worth attention, as anything which will give a fresh impetus to the somewhat stagnating branch of our art, portraiture, deserves consideration. There are many forms in which the double portrait might be made to possess sufficient interest to command customers. The same person either in private or professional life, in different costumes &c. might be made to possess sufficient interest to create a demand. Mr. Gill's quaintly comical renderings, such as a man shaking hands with himself, as an illustration to self-esteem; a little girl wheeling herself in a perambulator "Giving Herself a Ride," &c. &c., form a class of subjects for which a demand will probably be found. Mr. Samuel Glen Payne, sends us some admirable examples of the adaption to portraiture, and has managed, not simply to duplicate, but to triplicate the same figure in one card. Here we have a young lady, seated at a desk reading, leaning over the other side of the same desk, and standing beside a chair looking on, all on the same card, and admirably managed; then a youth stooping, to pick something from the ground, kneeling on a chair and leaning on the table, and standing watching himself in the other positions. Amongst Mr. Payne's "doubles," there is some admirably managed grouping, and occupation given to the figures, such as a man playing himself a game at chess, &c. &c., suggestive of the kind of interest which may be given to the subjects.

Mr. Gill has, however, gone further than this, and aimed at still higher results, having something beyond a grotesque interest. We have just received from him one of the most beautiful little art photographs we have seen, entitled "The Dream." The treatment is similar to that in the well-known picture of the "Soldier's Dream," after Campbell's lines; the same kind of effect has been attempted in photography before, more than once, and generally with small success; but this is very charmingly managed. A little child reclines fast asleep on a couch, and immediately above floating in the air is the same little child, slight and visionary, gazing with rapt face through the streaming light which envelopes her towards a radiant crown, which appears delicately and faintly made out above her. The effect is admirably managed, and is produced by a modification of the same manipulation as that employed in producing the "doubles."*

Besides the possible application which this suggests, there are others which strike us as worth consideration. No branch of portraiture is more difficult than that of grouping satisfactorily two or more persons in one picture. The exigencies of the lens demand a certain arrangement which is often the least comfortable to the sitters, and least effective in the picture; and even if then managed so as to secure a satisfactory pictorial result, it often happens that the movement, or bad expression of some one member of the group spoils the whole as a picture, and renders it comparatively useless. Now if the system of taking a group on the negative in successive sittings can be adopted, it is manifest that a much greater latitude as to arrangement and position will be possible, and that one person sitting at a time not incommoded by any other, and without the distraction of attention involved by grouping, a much greater chance of good expression and freedom from movement is secured, and thus in the matter of likeness and pictorial effect a far higher result will be obtained.

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* We have received since writing the above another still more singular and puzzling example of these multiform pictures. It consists of three figures, each of the same little girl, two of them are on the ground, and holding between them, stretched at arm's length, a plate of glass. Standing on the plate of glass is the third figure of the little damsel. The picture is entitled "positive on glass!" The joke is intended chiefly for photographers evidently.

There is a still further possible development of the principle employed in these double portraits, which appears to us important and promising. We refer to the use of shutters in the camera to screen off some portion of a landscape, such as the sky, during the exposure of the remainder. We know that this idea is not strictly a novel one, but it will be seen that our suggestion has a novel force derived from the experiences to which we have been referring. We know that a few years ago a patent was obtained for a complicated arrangement whereby a screen could be made inside the camera which should just correspond with the horizon line in the landscape. The elaborate and complex character of the arrangement, notwithstanding its ingenuity, prevented it coming into use. Mr. Archer used to employ some method of masking the sky during part of the time of exposure by a piece of paper or card just in front of the sensitive plate cut accurately to the shape of the horizon; but either from the method being imperfectly understood, or from being found not to answer well, the practice has never become general. But the experience with these double portraits has taught us that it is possible to place shutters in such a position, that no line of junction between the two halves exposed in succession, shall be seen on that most crucial of tests, a plain background. The suggestion follows, then, that by placing a screen at the right position inside the camera, the sky may be masked without the risk of any hard line being formed. The best position with a quarter-plate lens is found to be about one inch in front of the sensitive plate; with lenses of longer focus, the position would probably vary; but the adaptation is easy. We propose, then, to fit the landscape camera with a piece of wood placed a little distance in front of the sensitive plate. This piece of wood should possess, running from end to end, a groove in which a piece of blackened card or stiff paper would easily fit, standing upright. This paper might be easily torn into a rough correspondence, with the outline dividing the sky and landscape, which, in a very large number of instances, is not of a very intricate form. The experience we have referred to suggests that a very accurate correspondence between the mask and the outline would not be very imperative, as cutting the image at a point where it is out of focus would prevent a hard line being formed. A winch or handle projecting outside the camera would permit the mask to be turned down so as to lie flat at the bottom of the camera when it was necessary to expose the sky; and if found desirable, the screen might be gently moved in order to blend still more carefully the masked and unmasked portions. With such a contrivance, it would be possible to prevent the sky being overdone with the darkest foreground and the deepest coloured foliage, requiring very long exposure to secure detail, and it would often be possible, even with dry plate negatives, to secure a natural sky and fine clouds to the landscape. We commend the matter to some of our ingenious readers as one which will probably well repay experiment.

It has been often said that "history repeats itself." In photography this has often been the case; and it has also often happened that the resuscitation of old ideas, to be examined in the light of new knowledge and experience, has proved of great value. The production of two images on one plate is an old idea belonging to the pre-collodion era of photography; but we do not remember ever to have seen it managed so effectually, or by means so simple, as it has been during the last few months, as described by Mr. Gill, Mr. H. P. Robinson (to whose interesting and illustrated article in this number we invite attention), and Mr. Bockett, in our columns.

FORTHCOMING PHOTOGRAPHIC EXHIBITION.

We are glad to announce, that notwithstanding the pecuniary loss announced on the late photographic exhibitions, that the Council of the Society have resolved to hold another during the coming spring. Arrangements have been made, we believe, which must very much limit the chance of loss, and although the time for preparation is short, we trust that it will be only regarded as a reason for additional efforts to secure a successful result. The following circular note, which has just been issued, will apprise our readers of all the particulars as yet ready for publication:—

"Preliminary Notice.

"The exhibition of the Photographic Society of London for 1865 will open on the 1st of May, at the Gallery, 9, Conduit Street, Hanover Square, W. (now occupied by the pictures and sketches of David Roberts), and continue open for two months. The pictures must be delivered at the above address, on April 20th, 21st, or 22nd, addressed to

"Dr. Diamond,
"*Secretary of the*
"*Photographic Society of London.*

"Full particulars will be published in the course of the ensuing week."

From what we learn of the decisions already come to, this exhibition will be placed upon the most catholic and liberal basis. All photographers are eligible as exhibitors; all classes of pictures, plain and coloured, which possess merit, will be accepted. Medals will be given to whatever is deemed by the committee sufficiently meritorious, without especial compliance with conditions. In short, a wise liberality will govern all. This is as it should be, and we hope success will attend it.

The only regret we have in connection with the matter, is the fact that four important photographic exhibitions will be open at one time, in London, Dublin, Paris, and Berlin, and many photographers who would have contributed to each, may be scarcely able, in the short time, to be prepared with specimens, frames, &c., for all. As we have said, we hope that any difficulties in the way will only stimulate photographers to make a great effort rather than allow the exhibition of the Photographic Society of London to be found wanting.

During the time the exhibition is open a soiree will be held, at which it is hoped the Prince of Wales will distribute the medals.

REDUCTION IN THE PRICE OF MAGNESIUM WIRE.

We are glad to be able to announce to our readers, not only that the recent fire will not interfere with the supply of magnesium, but that a speedy and very important reduction in the price of the wire is about to take place. As the price alone is likely to retard the extensive use of this source of light, the announcement will be hailed with satisfaction by photographers generally. The following letter from Messrs. Johnson and Matthey gives the authoritative statement:—

"Referring to the paragraph which appeared in your last number headed 'Destruction of the Magnesium Metal Works,' we beg to state that although the fact of a fire having occurred is true, yet that the damage done is very inconsiderable, and there will not be a single day's cessation in the manufacture of the metal.

"It may interest many of your readers to know that a reduction *of one half* in the price of magnesium wire will take place on the 1st of April. In giving notice of so large a reduction, it is only due to the Magnesium Metal Company to state that it has been carried out at the earliest possible moment. Hitherto the working has been to a great extent experimental, and the manufacture upon a large commercial scale has only now fairly commenced, therefore the many economies incidental to an extended basis of operations (which alone would render such a reduction possible), have not until now been fully proved and developed."

Johnson and Matthey.

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COLLODION IN PRINTING—STABILITY OF PYROXYLINE.

BY H. P ROBINSON.

Any doubt thrown on the stability of the material on the permanency of which many hundreds of thousands of valuable negatives depends, is certain, no matter from what source it comes, to excite a momentary alarm amongst photographers; and when the chairman of the last meeting of the North London Association thought it good taste to disparage Mr. Simpson's new method of printing, on the score—in the absence of any real fault in the process—that collodion was a very perishable material, and no hope of permanency could be expected from its use, I, in common with many others, at once began to speculate on the possible fate of my own and other valuable negatives, if these remarks had any weight at all. When I further learnt, however, that this gentleman's notion of the instability of the collodion film was based on the fact that most samples of pyroxyline, *if boiled for an hour*, would decompose, I regained my usual serenity, as I reflected, that whatever might be the chairman's course of proceeding when he takes a negative, if he ever condescends to actual practice,—in no photographic process which I knew was it necessary to *boil* negatives, and I had not heard that it was necessary to boil collodio-chloride prints.

My attention called to the subject, however, I was induced to read carefully two reports on the Decomposition of Pyroxyline, which have appeared in the photographic journals during the last few months, and which, although doubtless very valuable for reference, are, I must confess, not the kind of photographic literature which I devour with avidity as soon as it appears. From both these reports, that of M. de Lucca, and that of M. M. Pelouze and Maury, I find the general fact, the statement of which is pretty well-known to photographers, that gun-cotton is a substance of somewhat uncertain constitution, very liable to spontaneous decomposition, and that light and heat very much accelerate this decomposition. These strike one at first sight as sufficiently uncomfortable facts, and had they been known and duly considered at the first introduction of the collodion process, they probably might have considerably retarded, if not entirely prevented its adoption. Fortunately for the art they were not known or regarded. I confess that I have not devoted much time, personally, to experiments in the manufacture and examination of samples of pyroxyline, and therefore I must, of course, take these reports as good authority so far as they go.

But, fortunately, I possess another kind of experience, which every photographer of any practice also possesses in a greater or less degree. I mean an experience in the keeping qualities of collodion films. At the North London meeting, Mr. Hislop spoke of the keeping qualities of dry plates, and other members spoke of the preservation of collodion positives and negatives for many years. But I am disposed to go further, and ask the question, Is there a single instance on record of a collodion film, either as a positive or negative, decomposing in the manner described in these experiments on pyroxyline? I believe not: nor that a suggestion even of such a thing was ever heard of, until there was a process to be smashed at all hazards, for its inventor's sake; which amiable intention was evident to all present at the meeting, the general feeling which was expressed by Mr. Cartland, when he said that he did not see that the process was to be condemned because it was the Simpsontype, or words to that effect.

As evidences of stability in collodion films, I could bring forward a long array of witnesses, I will content myself with mentioning that Dr. Diamond has in his possession many collodion positives, varnished and unvarnished, taken when he was assisting Archer to perfect the process, and before it had struck either of them that the collodion process might be used for negatives. Many gentlemen I know have positives and negatives which have been in existence nearly as long. I have positives and negatives which have been taken ten years; and I have on the table, as I write, a large negative taken by Archer in 1851; but in no instance which I have heard of or met with, has anything approaching injury from the decomposition of the film occurred. And let it be remembered that the conditions laid down as favouring the decomposition, are the presence of light and heat. Well, I suppose negatives get enough of these, from which even varnish does not protect them. When glass positives were fashionable, the show cases often got enough of both; and these contained unvarnished positives, but I never heard of any of them decomposing, either with or without detonation, as gun-cotton is said to do. It is no part of my business to explain why the collodion film is permanent, and gun-cotton unstable. But that the film is stable is an ascertained fact based on the experience of fifteen years. And I am disposed to attach more importance to well-tried experience than to any theoretical considerations whatever.

The use of collodion in printing is, as the editor of this journal recently remarked, on its trial. It may prove a complete success, or it may, after full trial, be found wanting; but its advantages and disadvantages must be proved by facts—not words. An admirable *prima facie* case was made out for it in Mr. Simpson's recent paper before the Society, and supported by such an array of excellent specimens as rarely can be produced by any new process. It will require a very different kind of evidence against it than theoretical statements as to the decomposition of pyroxyline, to stay its progress. My own experiments with it have been highly encouraging. Such skilful experimentalists as the "Photographer's Assistant," and Mr. H. Cooper, junior, declare for it, and back their opinions by producing magnificent pictures by it; and as yet I have heard no good argument against it.

There is another part of this subject upon which I should like to say a word or two, but I don't know that I have any right to interfere in it, beyond that right which every one of us possesses, not to see, tamely and silently, a benefactor of the art made the subject of detraction. The animus of the remarks at the North London meeting was apparent enough to everyone, and met with no sympathy there. Since then an article has appeared from the same source, in which that animus is made still more apparent, first in the sneer at what it is not ashamed to call "a simulated spirit of liberality," when a valuable discovery is given ungrudgingly to the world; and next, in the suggestion that the new process is based upon Messrs. Sayce and Bolton's dry process, "the only difference being the substitution of suspended chloride for iodide of silver in the collodion." In Messrs. Sayce and Bolton's process, by the way, bromide of silver is used and not iodide. But the evident intention of this remark is to detract from the originality of the new printing process, by regarding it as an imitation of Messrs. Sayce and Bolton's plan. What may be the value of these gentlemen's method I don't know, as I never tried it; but I know, as every reader of the journals knows, that the editor of the News described some experiments with suspended iodide and bromide of silver in the collodion, about four years ago, so that if the use of a chloride in the same manner, but for a very different purpose, have any resemblance to the use of iodides and bromides in collodion for producing negatives, it is clear that Mr. Simpson has had the priority, and that he has only imitated himself and not Messrs. Sayce and Bolton. I do not think it is necessary to dwell any further on the unfairness of this spirit of detraction, and I apologize to the editor for entering into the subject, my only excuse being that it ought to be done, and I fear that, so closely concerning himself, he would scarcely deign to give it the proper refutation.

[We should have been very reluctant to enter into any defence of our personal claims in this matter. We used iodide and bromide of silver suspended in collodion many years ago. The experiment was at the time an original one with us, but we ascertained that others had worked in a similar direction, accounts of which appeared in the News and other journals. We have now in our possession negatives we produced many years ago in this way; but as no special advantage was gained, we gave it up. The merit of Messrs. Sayce and Bolton was not that of originating the method of suspending bromide of silver in collodion, but of making a good dry process in that way. The writer of the article referred to by Mr. Robinson is probably ignorant of the history of these processes.

Regarding the decomposition of the collodion film, Messrs. Sayce & Bolton have never, so far as we are aware, claimed the origin of suspending bromide or iodide of silver in collodion, although it was very possibly an independent discovery on their part. But they did something more useful than this; they succeeded in what others had failed, they originated an excellent dry process of practical value, with the materials which other hands had failed to render useful. We have, in introducing our process, very carefully abstained from talking about our personal claims; but we may say unhesitatingly that the possibility of suspending chloride of silver, and the application of the fact in form of a practical printing process, are distinctly new and original, and were unknown until we published our first experiments.

Regarding the decomposition of the collodion film, we know of no case in which it has happened. We have in our possession a collodion positive, unvarnished, which was taken by Dr. Diamond in 1850, and we have an unvarnished collodion negative of the Exhibition of 1851, besides many of our own ten or a dozen years old. None of these have any trace of decomposition. It is an interesting and important fact, that whilst pyroxyline is undoubtedly at times liable to decomposition, yet in the collodion film it appears to be very permanent. If it were worth while to contrast the remarks of the writer referred to, which really matter very little either way, on our process, with his own remarks on another collodion printing process, some months ago, we should find him then declaring that notwithstanding the possible instability of collodion, yet, on theoretical grounds, no more perfect silver process had come under his notice.—Ed.]

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BROMIZED COLLODION PROCESS.

BY B. J. SAYCE.

A correspondent, "C. C.," in the News of 24th inst. under the heading of "Landscape Photographs," states that the bromide bath which he finds invaluable, was first suggested by my much regretted friend the late Mr. Glover, which, however, happens not to be strictly correct.

As the *actual* originator of the bromide washing for removal of free nitrate of silver, I have much satisfaction in hearing of its efficacy in other hands, but in justice to myself, and in proof of my claim to the title, I would refer your correspondent and readers to my letter upon this particular subject, which appeared in the *British Journal of Photography*, on the 15th December 1863.

After the publication of this idea, Mr. Glover—with whom I was in almost daily communication—adopted the practice, and alluded to it in his writings.

While I have the pen in hand allow me to trespass a little further upon your space, and remark that I cannot account for the excessively long exposure, viz., 10 to 15 minutes, which "C. C." appears to give to plates prepared with *bromized* collodion, the use of which he recommends.

It is true that the condition of "dark scenery" is inserted, but surely the exposure must be in the absence of sunshine, or when a slow lens of long focus and a small stop is employed, for in my own practice I find bromized collodion and 15-grain tannin preservative, with carbonate of ammonia development, quite as rapid as wet collodion and iron development; also instantaneous when such is the case with the wet collodion process.

I am glad "C. C." finds the process with bromized collodion a good one, Major Russell, as the inventor, and myself as an apostle or martyr to the process (if you will allow me to use the terms), have had many stones thrown at us, and no one would believe that there was any good in it. One finds it perfectly impossible to obtain the slightest trace of a picture; another, more fortunate, secures an impression, but cannot intensify the same, while a third, after having accomplished both with ease, and to his intense delight, discovers, with still greater chagrin, that the charming negative, during the last piling up of the agony prior to fixation has become irretrievably "fogged," and, horror of horrors, beyond redemption.

These statements, coming from those who had a right to find fault, and able to pass an opinion upon matters photographic, formed certainly an alarming broadside of evidence for the "opposition,"—still, on the other hand, there were a select few, a little band of followers, whose patience rivalled that of our worthy exemplar Job, who, nothing daunted, pursued their experiments, spoiled perhaps a dozen plates, but at length succeeded in obtaining that which their soul desired, a plate adapted to any exposure hitherto limited to the more advanced negative process of wet collodion.

Now, as spring time has arrived, and despite keen easterly winds, and stormy western gales that alternately work processes dry and wet, photographers are sufficiently sanguine to hope that brighter days are in store, that "old Sol" will yet show his beaming face, and that those well-remembered red letter days will again be realized when, shouldering the camera and portable stand, we shall wander forth amid fairy glens, and by the side of many a merry mountain stream, pursuing our search for the beautiful, and revelling, by anticipation, in the pleasure we shall re-enjoy when, over the evening weed, we muse on the day so happily spent, and feast our eyes with the sight of negatives so soft, so wondrously full of detail, and yet, therewithal, sufficiently dense, such as never yet were seen (for all negatives *in future* possess these indispensable qualifications), that while conjuring up these castles in the air, we dare not to disturb the blissful reverie, by even the thought of a probability that our labour of love might prove fruitless; but still the reality does so happen sometimes.

> "The best laid schemes gang oft agley,"

And we, like our neighbours, must share the trials incident to man.

Mr. Editor, will you, in your goodness, accord another space that, to the best of my ability, I may introduce a few practical notes, which have been of service to myself, and will, at least, not injuriously affect the manipulation of my brother amateurs.

Firstly, then, bromized collodion to give density and creaminess of film should contain nine grains to the ounce of bromide; that of cadmium acts admirably if allowed to mature; six grains of ordinary soluble pyroxyline, with equal parts ether and alcohol, and when filtered, the mixture is complete.

The pyroxyline *may* be reduced to two grains, but then the bromide should be increased to ten or twelve grains. Opalescence of the film is produced by sufficiency of bromide, and by the collodion being allowed to "set" freely prior to immersion in the bath of 60 grains, which should be slightly acid. Keep it in for ten minutes, then place in a dipping bath of distilled water, afterwards in the bromide bath before referred to—say from 2 to 10 grains of bromide of ether, potassium, cadmium, or ammonium, to the ounce of water; and finally wash surface and back under a tap. It is now ready for the tannin; but for convenience put it into a tank until, say eight plates, are also in the same state, then have a 15-grain solution of tannin, *well filtered*, placed in flat dishes or dipping troughs. To save time, I have eight in use. I then take the first plate prepared, and immerse it face upwards in the tannin, then do the same with the other seven in consecutive order. When the eighth is in the tannin, remove the first, and place it on the drying box, with hot water, or any other drying contrivance that may be used, and continue the removal until the eight are boxed up. The drying should be *even* and moderately quick. Plates may be well dried before a red fire, if not interrupted during the process.

Uneven drying is the cause of at least three-fourths of the stains that so often mar dry plate negatives that otherwise leave no room for complaint.

Respecting exposure, it is a favourite practice to over-expose, or prolong the exposure indefinitely with the intention of thereby obtaining detail and softness. So many have adopted this plan that it has become almost general among dry plate workers of the olden style, who, unfortunately, have carried the same idea out when working with rapid plates, prepared by this or other improved processes,—and with what result? Want of vigour and intensity, and a negative yielding a flat unsatisfactory print, and, perhaps, slightly fogged. The process is blamed, "Can't get up density," is a common cry. My good friends, please bear in mind that five minutes longer makes little difference in a plate that requires twenty minutes exposure; but sixty seconds for a subject for, which ten is ample allowance, will tax your developing capabilities severely, if you have not been in the habit of working with rapid plates.

Expend a few plates in testing exposure (say four consecutively upon the same subject), we will estimate the correct time to be, say twenty seconds, for an ordinary landscape subject with single stereoscopic lenses of six inches focus, and a quarter inch stop. No. 1, expose five seconds; No. 2, ten seconds; No. 3, twenty seconds; No. 4, thirty seconds. Employ the same development for each, and the result will be:—

No. 1. A weak positive, wanting in detail and density.

No. 2. Lights very dense, and somewhat opaque, shadows transparent, and without half-tone, prints hard.

No. 3. Full of detail, deep shadows only transparent, light of a rich warm colour, through which objects can be seen, intensity being rather from colour than silver deposit—a perfectly exposed negative.

No. 4. Details in full, shadows slightly clouded, sky very weak, lights printing through, want of vigour, and general flatness of effect.

Of course, an experienced operator will compensate for over-exposure by judicious treatment during development; but few who have worked slow plates believe it possible that ten seconds can produce such varied results, and therefore are apt to continue the over-exposure, and blame, and cast aside a process, the threshold of which they have scarcely crossed.

Last summer Major Russell propounded a new and curious theory with respect to the fogging of bromide plates, with which evil it appeared that this eminent experimentalist had been for some time troubled. Determined to know the cause, he patiently and carefully recapitulated his working; but still the fog prevailed. After numerous experiments it was found that the difficulty arose from the absence of unaltered bromide in the film, a condition essential to success.

In the *ordinary* manipulation of bromized plates we do not frequently meet with fog such as Major Russell encountered, for, as a rule, our preparation of plates is continued without interruption until completed, and *at the time* it was not shown under what peculiar circumstances it had been noted. Opinion, therefore, favoured the supposition that the effect was the result of circumstances purely local, since many who were working the process (including myself) had never found reason to complain that liability to fog was one of its peculiarities.

This opinion I expressed at a meeting of the Liverpool Association, during a discussion which followed the reading of Major Russell's paper, and though subsequent experiment has proved to me beyond doubt that Major Russell's theory is correct, and that to ensure clear pictures the presence of unaltered bromide in the film is an absolute necessity, I was then, however, unable to account for the matter, and wrote to Major Russell to ascertain the details concerning his operations. During this correspondence it transpired that at times it was his practice to allow the plates to remain for a lengthened period, frequently all night, in water, in order to divide the labour of preparing them. Sensitizing being performed upon one day, the tannin upon another. During this soaking all the soluble bromide salt had been washed out of the film, leaving therein nothing but insoluble bromide of silver.

This, then, might be considered the practical cause, and now, forewarned by Major Russell, we profit by his experience, and resort to his remedy for fogging by restoration of free unaltered bromide to the film during or previous to development.

In order to accomplish this without interfering with, or accumulating labour in our manipulation, have ready a saturated aqueous solution of bromide of potassium, and pour of this, say one drop, into the quantity of alkaline developer with which the plate is about to be covered, an excess has the effect of retarding development, and should the image not freely appear, wash the plate and use fresh developer containing no bromide.

I seldom find it necessary to use this precaution, but it involves so little trouble that I have always the bromide at hand in case of need, and at the slightest fog alarm, bring forth my reserve, and swill the plate with water to which a few drops of bromide have been added.

Major Russell has suggested another plan, to which I would refer those interested in the subject.

Another grievance, *transparent spots*, ranging in size from a pin's head to that of a pea, having a very minute central speck of bare glass.

These have been very prevalent during the past year. I have noticed them, not only in bromized plates, but in those prepared for sale, and also when bromo-iodized collodion has been employed. There have been many theories brought forward to account for this phenomenon, but to the best of my knowledge, none have conclusively traced the cause to its source.

I attribute those which I have met with to an inferiority in the bromide used in preparing the collodion, for my own troubles in this line commenced upon using a new lot of bromide of cadmium, and vanished when I returned to the old make. But should any find themselves similarly situated a very simple plan will (or at least as far as I am concerned, has succeeded), effectually banish the evil.

Filter the collodion through cotton wool, well-packed in a retort filter. One filtration will be sufficient if not a bad case. But should such be the state, use fresh cotton wool, and filter twice. So easily is the filtering accomplished, that I now never use collodion that has not been passed through at least once. Mr. George Wilson, of Aberdeen, whose success is proverbial, endorses the practice by *his* valuable recommendation.

Development of the exposed plate cannot be better effected than by the alkaline method, using either carbonate of ammonia or soda; that of ammonia is more energetic. Mr. Jabez Hughes's mode of operation published last year very clearly defines the conditions of success.

I have used none other than alkaline development since November, 1862, and can testify to its invariable success.

I have been induced to make these remarks in order to reply to many enquiries which have been addressed to me by private correspondents, who, I trust, will excuse the brevity of my answers to their communications.

Shortly, I will reply to others respecting the collodio-bromide of silver process for negatives without nitrate of silver bath. Paper prints can also be taken by the process, similarly with your collodio-chloride process, and by the latter you will find that negatives can be well taken, and the mixture of the two is an improvement.

In May, last year, I also worked with a simple chlorized collodion, excited in a 60-grain bath, with excellent results.

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DOUBLES, AND HOW TO DO THEM.

BY H. P. ROBINSON.

"Methinks you are my glass, and not my brother!"—Shakespeare.

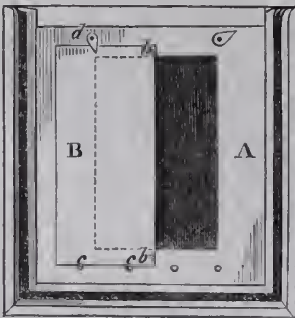
Ghosts, apparitions, wraiths, doubles, fetches, eidolons, döppelgangers, poltergeists, and their supernatural kindred, have been believed in, more or less, from the days of the Witch of Endor down to those of the Davenport Brothers and modern spiritualists, but it was never supposed that the prosaic art of photography would be able to present a representation of the same individual in two places in one picture; a "double" in fact; a picture of that peculiar kind of insanity—"a man beside himself;" "me and myself" in the same carte. But this has been done, and to make the "double" more curious, it has been introduced by photographers quite independently of one another in at least three places—England, France, and America—at the same time, which is a very proper and ghostly sort of thing for it to have done. It is wonderful how full the art is of coincidences of the kind, genuine coincidences too. Calotype and Daguerreotype were invented independently, and introduced simultaneously, and so was almost every other discovery of importance since the art begun.*

But to return to the "double," in which we are at present most particularly interested, and the means whereby it is most easily and perfectly produced.

About the middle of last November, a gentleman, who is interested in photography in Paris, sent me a card containing two figures representing the same person in two attitudes and in different costumes, and asked the question,—"Can you guess how it is done?" Now, although I have had a good deal of experience in "putting this and that together" in the way of combination printing, I had to confess I was puzzled, and so were many of my friends, to whom I showed the picture. Being very much interested in this photographic curiosity, I thought it over a good deal; but it took me a month before I bit upon the method of producing them. The method is so simple that anybody might be excused for stumbling over it without seeing it. I discovered shortly afterwards that Mr. G. R. Gill, of Islip Street, a gentleman whom I have long known as an accomplished artist and skilful photographer, had been producing these pictures for some months, and he had added to good manipulation a grotesque fancy which made his pictures much more interesting than a mere representation if the same individual simply repeated.

About the same time Professor Towler wrote an article on "Card Pictures representing the same Person in two different Positions on the same Cards," in *Humphrey's Journal*, which may be found together with an article on the same subject by Mr. Gill in the News for Feb. 10th.

An illustration is always better than a written description. I have, therefore, made a sketch of the camera adopted by Mr. Gill, and which arrangement could be added to any rigid camera.



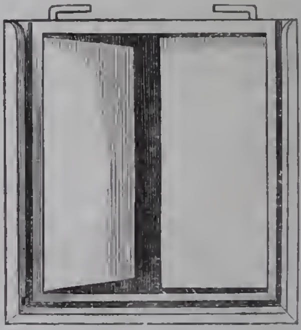
A diaphragm A is fixed in the camera immediately in front of the grooves in which the dark slide is inserted, having an aperture measuring for cards about $4 \times 2\frac{3}{4}$. A piece of zinc, B, is made to fit against the studs, *b b*, it rests on the studs, *c c*, and is secured in its place by the button *d*. To take a picture the figure is placed so that the image shows on the ground glass through the aperture left uncovered by the mask of zinc. The plate is then exposed. The zinc is now reversed to the other side of the aperture, and the figure is also moved so as to appear on the ground glass through the aperture left open, and the plate is again exposed. Great care must be taken that neither the furniture and accessories nor the camera are moved during the operation. If the zinc mask has been made to fit properly, it will be found on developing that there is not the slightest trace of a joining to be seen even when a plain back-ground has been employed. The reason of this is, that the diaphragm being placed a short distance from the plate, the edges of the shadows are not sharp, and they overlap, and are vignetted, as it were, into each other.*

The various parts in the sketch have been engraved of different shades for distinctness, but they should be all painted black.

The mask might be made to slide into grooves, but would require very exact fittings.

Another form of camera might be made which would answer the same purpose, and would do away with the trouble of removing the dark slide to adjust the mask.

This would consist of the ordinary camera employed for portraiture, with the addition of two doors meeting in the centre, and which might be moved by winches from the outside, as in the illustration, and used in the same manner as the one designed by Mr. Gill, except that instead of the zinc mask being altered, the doors would be opened and shut alternately by the winches.



It sometimes happens that it is necessary for part of one of the figures, a lady's dress for instance, to cross the plate from one side to the other. In this case, special masks must be made to suit the form of the figure, and to effect the junction of the two exposures in the most unimportant part of the picture. Instead of straight down the middle of the plate, it might be oblique or zigzag or any form necessary. A little ingenuity in the photographer will enable him to overcome any difficulty of this kind without much trouble.

A very curious effect has been produced by making a picture of a man shaking hands with himself. The joining of the hands would at first sight appear to be an inseparable barrier to a successful result. It has been suggested that the assistance of a third person must be necessary to produce this effect, by "lending a hand," but such is not really the case. The only thing that is necessary is, that the two hands shall be held singly in exactly the proper place, representing the grasp of friendship in the usual form. To do this, a rest for the hand is absolutely necessary, and a difficulty arises as to what kind of rest can be used so that it shall be invisible. This Mr. Gill has overcome in a very simple way. He stretches a dark-coloured thread in the following manner:—

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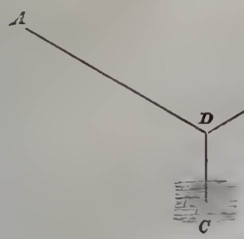
* Another of those singular coincidences is found in the fact that Mr. Robinson had designed and placed in our hands for the wood engraver at the beginning of last week a pair of shutters like lock-gates, opening and closing by a handle at the top of the camera, to illustrate his article, and the first thing he saw at the meeting of the North London Society, a day or two afterwards, was Mr. Bockett's camera with the identical shutters attached. —Ed.

* Since this article was in type, we have received from Mr. Gill an intimation that he has improved upon the shutters he originally used, and has adopted an arrangement for moving them from the outside; different, however, from that suggested by Mr. Robinson.

The ends A and B are fixed to the walls of the studio, and C to the floor.



The angle D forms the required rest; the threads, if they are of the proper shade, will not show in the photograph, and, what would scarcely be expected, the hands join in the most natural way possible.

BINARY PICTURES.

BY J. BOCKETT.[*]

As I thought it not unlikely that some of our members might wish to take some of these peculiar cartes, I have brought with me a camera which I have adapted to the purpose. Although in (I think it was three numbers back of the *British Journal*).[†] allusion was made to shutters fitted to the interior of a camera, which were not to over-lap, no definite instruction was given as to the space to be left between them. I shall simply describe the camera before you, and also the four experiments made.

The portion of a camera in which the back slides, is perforated top and bottom with two holes, in order that two shutters of zinc or wood, properly blackened, may be moved by means of brass milled heads upon the top of the instrument inwards towards the lens: the milled heads are to be sufficiently long to have a slot cut in them, which takes hold of the upper part of the flap, and can either be soldered or fitted with a screw. Of course, the one grand thing to be obviated is the dark or light line which will appear in the negative if the apparatus is not properly made. In the first attempt, the zinc doors were 1-16th of an inch apart,—this gave a white line as in card No. 1. Attempt No. 2 was made with one shutter placed at an angle, the other just partially shading the edge thereof; this gave a dark line. In the third trial, the shutters were made to over-lap, which gave a line harder than all. I was somewhat troubled to know how I should fit an adjusting plate so as to increase or diminish the slit when the two shutters were closed: this is effected by bending a piece of metal over so as to slide stiffly upon one of the plates. In the last and successful trial, the edges of the shutters are chamferred off, and pins fitted to the bottom of the camera, so as to allow the edges almost to touch, but not so absolutely. In an instrument made for the purpose, I should certainly think that sliding pieces should be fitted with four slots and screws, in order that a perfectly central line of light may be obtained, and any necessary adjustment made. There also appears to be an advantage in having the shutters fitted at an angle instead of close to the sensitized plate. Further improvements might also be made by subdividing the perpendicular shutters, and fitting them with four milled heads for rotation, and in fact, there appears to be a great range for ingenuity, if required, to produce these photographic curiosities.

Acting upon the principle that if we conquer any little difficulty, as members of a society, we should be bound to save the time of others going over the same ground by describing it early, causes me to bring this before you. I shall also be glad to hear an explanation as to why a pencil of light, which really must act upon the plate twice the time of either exposure necessary to produce the negative, should, when brought to a minimum, not produce a line.

The pictures have been very hurriedly printed, and I have not had time to produce better. I have, however, brought the negative, which, I think you will agree with me, does not show where the junction takes place.

ON A NEW TONING BATH FOR POSITIVES.

BY M. CAREY LEA.[*]

Some experiments which I made some time since resulted in the discovery of a new toning bath for positive silver prints, which worked so easily and pleasantly that I have since used it a good deal, and believe that it may be found acceptable to other photographers. It owes its activity to the use of *benzoic acid*, which, so far as I am aware, has not previously been employed for this purpose, and is prepared as follows:—

Three or four grains of caustic potash are dissolved in water in a glass vessel, and the solution is supersaturated with benzoic acid. The exact quantity of the acid is unimportant, provided that rather more than enough to saturate the alkali is added. The first portions of acid dropped into the potash dissolve instantly, by combining with the potash, and when a fresh addition refuses to dissolve after a few moments, it may be concluded that enough has been added. The solution is then to be warmed till the remaining acid dissolves. Three or four grains of chloride of gold in solution are then added, and the whole diluted so as to form a bath of eight to twelve ounces, according as a stronger or weaker bath is preferred by the operator, also according to the season and temperature.

The bath thus prepared is ready for immediate use, and has excellent keeping qualities. I have never found that any toning bath could be counted on with positive certainty for producing precisely the same effects after standing for some days, but I can say for this, that I have found it at least as constant as any other. Albumenized paper is toned by it to nearly the same warm shades as with the acetate of soda bath. It might naturally be expected that this bath would have a certain resemblance in its effects to the acetate of soda bath, and such is certainly the case. I have made a benzoate and an acetate bath side by side, and have toned successive prints alternately in each, and for comparison, have cut prints in half, and tried one half in each bath. Whilst the action was very similar, the comparison resulted in favour of the benzoate bath, as the more certain and regular of the two.

With albumenized paper, the shade of colour produced by the benzoate bath was almost exactly the same as with the acetate bath. But with some specimens of plain paper, an entirely different tone was obtained, a peculiar and beautiful shade, unlike any other that I have seen,—a deep golden brown. A brown tone in photographic prints is generally very unpleasing and undesirable, and there is a very familiar shade of brown that is often got by bad photographers when they meant to get purple black. But this brown is very different, and for certain purposes, especially for views, would be very appropriate, and give a pleasing variety.

Some careful experiments as to the permanence of the pictures obtained in this way, led to the conclusion that it was the same as that afforded by the acetate toning, and neither better nor worse. In one respect this bath differs materially, as will be observed, from the acetate bath,—that it is an acid bath, whilst the latter is either a neutral or an alkaline bath, according as crystallized or fused acetate of soda is used to make it. And the benzoate bath is the only really good acid bath which I know of. It requires no particular overprinting, like a bath acidulated with chlorhydric acid, but in this respect stands about upon the same ground as the neutral baths, probably in consequence of the feebly acid character of benzoic acid.

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[*] Read at a Meeting of the North London Photographic Association, March 22nd.

[†] The first description published in this country appeared in the Photographic News six or seven weeks ago.—Ed.

[*] From the *Philadelphia Photographer*.

Whilst I recommend this new bath for the production of those beautiful shades of warm purple black, which seem so appropriate for landscape photography, I am induced to think that for general purposes, the pure plain neutral bath of colourless protochloride of gold will eventually drive out all the mixtures made up with such materials as the so-called chloride of lime,—a mixture of caustic lime, chloride of calcium, and hypochlorite of lime, in uncertain proportions, —which, with or without other fanciful admixtures, enter into many of the toning messes of the day.

To my mind, there has been published nothing so satisfactory on the subject of toning, as the careful studies of Messrs. Davanne and Girard, and I take the more pleasure in saying this as I have felt obliged to differ from them on some points, particularly as to the existence of a yellow compound of sulphide of silver with organic matter, and I especially agree with them as to the advantages, theoretical and practical, of simple, plain, neutral toning baths, for positive printing on albumenized or plain paper.

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Proceedings of Societies.

North London Photographic Association.

The annual meeting of this Association was held in Myddelton Hall, on the evening of Wednesday, March 22nd. Mr. G. Dawson in the chair.

The minutes of a former meeting having been read and confirmed, the following gentlemen were elected members of the Society: Messrs. Russell Manners Gordon, W. Bedford, Herbert Smith, W. A. Clark, R. Temple, and W. Malby.

Mr. W. Warwick King then read the following :—

Annual Report of the Committee for 1864.

"Your committee have great pleasure in reporting the continued prosperity of the North London Photographic Society, and the addition of several new members, amongst whom are photographers of the highest eminence. Although papers have not always been forthcoming, yet the following subjects will prove that there has been no lack of interesting matter for discussion at the various meetings :—

"Mr. Sydney Smyth on enlargement by the solar camera. Mr. George Dawson, M.A., on the use of nitrate of soda in the printing bath. Mr. Bockett on cheap contrivances in connection with photography. Mr. Stephen Thompson on Photography among the Alpine Passes of Switzerland, Italy, and the Tyrol. Mr. W. Warwick King on Neglected Art Fields for Photographers. Mr. W. H. Warner on a New Camera Stand. Mr. H. Hislop, F.R.A.S., on a Camera Stand invented by him. Mr. Highly exhibited some transparencies with the magic lantern. Several manufacturers have contributed new apparatus, and we must not omit to mention the demonstration of the use of the oxyhydrogen light in the magic lantern by Mr. James How, of Foster Lane, whose illustration of microscopic objects from Dr. Maddox's very beautiful photographs was in every way most valuable.

"To Mr. Francis Bedford the society has been much indebted for the occasional exhibition of some of his finest photographs, especially those illustrative of our national antiquities. Allusion, has been made to the want of papers at our meetings; your committee have good reason to hope that this, for the ensuing year, will be fully supplied, as they have received several promises of papers of members, and others well-known in the photographic world.

"It is contemplated by a number of influential residents in the northern part of London to hold an Exhibition of Arts and Manufactures at the Agricultural Hall next Autumn. Arrangements have been made for devoting a part of the exhibition to photography. This will doubtless be under the management of your committee, one of its members being among the earliest promoters of this most desirable scheme; thus an opportunity will be afforded for a photographic exhibition in this district of London, which your society has often heretofore contemplated, but never been able to carry out.

"Your committee have deemed it advisable to suggest that the number of Vice Presidents shall be four instead of two, as at present.

"The *British Journal of Photography*, having been, since your last report, issued weekly, your committee has found it necessary to discontinue the supply of that periodical to the members; but they are of opinion that a special vote of thanks is due to Mr. Greenwood at the termination of their connection.

"Feeling, however, that your society should still have an official representative in communication with the Photographic Society, for the purpose of a supply of their journal to your members. In answer thereto, they have to state that the Parent Society has met them on most liberal terms, and arranged to send their own reporter to your meetings. By a recent resolution of their council, members of your society will have the right of admission to all ordinary meetings of the Photographic Society.

"The course thus taken will, it is submitted, tend greatly to the advantage of your society, as without any higher subscription than the present, it will be kept "*au courant*" with the chief improvements in photography, and be enabled to increase the number or value of photographs presented to your members.

"Members not wishing to have the *Journal* will be permitted to receive an addition to the number or value of their photographs.

"Your committee have taken into consideration the change of the day of meeting. Your present days have always had an uncertainty about them. They, therefore, propose to hold your meetings on the first Wednesday in every month, instead of the last Wednesday but one, as at present.

"In conclusion, your committee would urge you to exertion both in providing subjects for exhibition at, and papers for, the meetings, as it is only by the active interest of every member that the society can maintain a good position in photography."

The Treasurer's report was then read as follows :—

The Treasurer in Account with the North London Photographic Association.

Dr.	£	s.	d.	*Cr.*	£	s.	d.
To Balance for last year	32	16	8	By Photographs and Journals	62	13	7
Subscriptions	73	6	6	Rent, Printing, Stationery, Postage, &c.	11	19	0
				Balance	31	9	10
	£106	3	2		£106	3	2

Examined and found correct,

J. COLLIS, } *Auditors.*
J. HOW, }

March 22, 1865. D. W. HILL, *Treasurer.*

On the motion of Mr. Dallmeyer, seconded by Mr. How, the reports were received and adopted.

Mr. Hislop thought that especial attention should be called to that clause in the report which referred to the liberal and kindly manner in which the Parent Society had fallen in with their views in supplying the *Journal*, and he now was able to inform the meeting that the Council of the London Society had invited the members of that Society to attend any of the ordinary meetings held at King's College. He had the pleasure of moving a vote of thanks to the Council of the London Society for the liberal terms on which they had offered to supply the *Journal of the Society*, and for the kind invitation to their meetings.

Mr. Bockett having seconded the resolution,

The Chairman said there could be only one opinion he thought on the subject, and he doubted not that this Society would reciprocate the feeling by giving any members of the Parent Society a welcome at their meetings.

The resolution was passed unanimously.

The Chairman then said that to carry out the further proposals of the committee in the report a few alterations in the rules would be necessary, and these had better be considered at once.

After some conversational discussion it was agreed that the rule stating that there should be two vice-presidents should be altered to make the number four; that the meeting nights should be on the first Wednesday in the month, instead of on the last but one, the annual meeting being on the first Wednesday in March: and that officers, to be eligible for re-election, should have attended at least half the committee meetings held during the year.

The Chairman said, that as the election of officers was the next business, he wished to resign his position as one of the vice-presidents.

The following officers were then elected:—*President.*—C. Woodward, J.P. *Vice-Presidents.*—Messrs. Cole, Hislop, King, and Shadbolt. *Committee.* — Messrs. Ackland, Bockett, H. Cooper, Foxlee, Goslett, How, Robinson, and Wharton Simpson.

Mr. Collis (of Ottewill, Collis, and Co.) exhibited some varied designs of cameo pictures by Mr. Long, of Exeter, and Palmer, of Stonehouse, the latter being styled "Quinque Gems," as containing five portraits instead of four as in the diamond cameos; also a fine enlargement on canvas by the solar camera by the latter gentleman.

Mr. H. Cooper showed some very fine examples of the Wothlytype, and also of sulpho-cyanide and gold toning with ordinary albumenized prints.

Mr. Simpson showed a number of specimens of his collodio-chloride process.

Mr. H. P. Robinson exhibited some specimens of Mr. Gill's clever "doubles," in which the same person was seen shaking hands with himself, &c. After some conversation on the subject,

Mr. Hislop said that doubtless most of the members had taken an interest in the new printing processes recently introduced, that of which Mr. Cooper had shown such fine examples, and that of Mr. Simpson. With regard to the latter, he thought it would possess a pecular interest for them, and they would doubtless be anxious to experiment with it if they knew where to procure the materials ready prepared, which he hoped some of the dealers would undertake to supply, as many amateurs might not find it convenient to prepare them for themselves. If they could be procured ready prepared he hoped many of the members would test it and report results at the next meeting. It was possible that when many persons were engaged upon the subject still more interesting and important facts might be brought out. Some of the specimens Mr. Simpson had laid on the table were amongst the finest photographs he had ever seen.

Mr. Cooper had found the plain collodion sent out by Messrs. Mawson & Co., at 4s. per lb., answered well for the Wothlytype, and he thought it would also for Mr. Simpson's process.

The Chairman thought that a great objection to any collodion printing process, was the instability of collodion itself, and he thought that applied to paper it could give no hope of permanency. In Mr. Swan's carbon process, in which collodion was employed, it split up, and destroyed the print. In negatives, if unvarnished, the collodion would go sooner or later. He thought it was working in the wrong direction to apply collodion to paper. It might be, however, that chloride of silver could be held in suspension in some other preparation, such as albumen or gelatine, which would give a greater chance of permanency.

Mr. Hill thought the collodion would penetrate the paper, and not split oft.

Mr. Simpson said, that to a certain extent it would. He thought photographers would receive with considerable hesitation, any idea to the effect that the material of which they formed their negatives, and upon which so much depended, was of a very perishable nature. All experience was against such a conclusion. In the early days of the collodion process, it was a common thing to use negatives without varnishing them, and he never heard of one decomposing or splitting off the glass, except by scratching, &c. He had, in his own possession, collodion positives and negatives, which he had kept unvarnished for at least ten years without injury. Dr. Diamond had some which were taken in 1850, now as perfect as the day on which they were taken. This was, he believed, a general experience. As to splitting off the paper, that was purely a matter of practice; if a suitable collodion were used, no such danger would exist. Many of the samples on the table, taken on unprepared or prepared paper, the collodion could not possibly be removed by splitting; they must be dissolved before they could be removed. If a very unsuitable horny collodion were used, it would, of course, be easy enough to make it split off. He had had many scores of Mr. Swan's specimens through his hands, and had several now in his possession, which he had had twelve months, and he had not seen such a thing happen in a single instance.

Mr. King referred to a carbon print exhibited in a window in the Strand, which was much cracked.

Mr. Simpson had seen it; but believed that the cracking was rather due to the gelatine with which it was mounted, than to the collodion.

Mr. H. Cooper said it must be remembered that in collodion printing the collodion was applied in a very different way to that in the carbon process. In the latter it was poured on glass and dried, and then formed part of a tissue with gelatine, the whole being subsequently attached to paper by mounting. In collodion printing it was poured on the paper, with the fibre of which it became, as it were, entangled and entwined, so that if it were at all of suitable quality, there was little chance of its cracking or peeling off.

The Chairman said the great object was to keep it on the surface, and prevent it sinking in. He found in the Wothlytype the best prints were those in which the image was kept on the surface, and the collodion in such case was very apt to come off in washing &c.

After some conversation,

Mr. Foxlee referred to a report which had recently appeared in the journals, on the decomposition of pyroxyline, from which it appeared it was very liable to spontaneous decomposition.

Mr. Hislop did not think that this was true of the collodion film. He had kept prepared dry plates at least seven months, of course unvarnished, and had never seen the least tendency to such decomposition.

Mr. Simpson said the reports which had been published had not been made specifically in reference to photography, but to the various examples of gun-cotton viewed in relation to military matters.

The Chairman said the most explosive cottons were least liable to decomposition, and the most soluble samples most liable. All samples would decompose if boiled for an hour in water.

Mr. Simpson said that whilst some samples of pyroxyline, made under peculiar conditions, were doubtless liable to spontaneous decomposition, it was an exaggeration to regard this as a necessity or even a frequent occurrence. He had, in his possession, kept loosely in jars, pyroxyline which had been made for years, in which no change had taken place. Some of the specimens on the table were produced with a cotton he had himself prepared five years before.

Mr. G. Cartland said he thought the meeting was much indebted to Mr. Simpson for a sight of such beautiful specimens, and he thought all experience pointed to great probable permanency in them. Doubtless suitable materials for producing them would be soon found in the market. It was impossible to look at such pictures without seeing that a great step in the right direction had been made in positive printing, and he thought that instead of depreciating the process because it was invented by Mr. Simpson, the best thanks of photographers were due to him (applause).

Mr. Hislop asked if the sizing of the paper made much difference.

Mr. Simpson said, so far as he could judge at present, an old hard sized paper gave the best results.

Mr. Foxlee said as, besides chloride of silver, a certain excess of free nitrate was necessary, he thought the Chairman's suggestion as to the use of albumen or gelatine as a vehicle, would be inapplicable. Collodion appeared to be the only suitable material.

Mr. Simpson said that of course the nitrate of silver could not be added to albumen without coagulating it, and as for gelatine, supposing it could be used as a vehicle, it would be impossible to tone, fix, and wash the print without dissolving it off the paper.

Mr. Collis said a gentleman sitting by his side had just mentioned that some of the original positives taken at the outset of the collodion process, were still in existence, without any signs of decomposition.

Mr. How said he had some of the collodion negatives taken in 1851, still unvarnished, and quite perfect.

Mr. Bockett then read a paper on "Binary Photographs" (see p. 151). He exhibited a camera with the ingeniously contrived shutters he described, together with some good negatives and prints illustrating the plan described.

After some conversation on Mr. Bockett's ingenious "doubles,"

Mr. King expressed a hope that on Mr. Dawson's retirement from vice-presidency he would not leave the Society, which he hoped would be favoured with more valuable papers from him, Mr. Dawson said in retiring from office he should not retire from the Society, and he hoped to be more useful as a private member than in an official position.

The proceedings then terminated.

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Correspondence.

PHOTOGRAPHY IN GERMANY.

Berlin, 20th March, 1865.

Our forthcoming Berlin International Photographic Exhibition will be very interesting for many reasons. It is the first of the kind which has been held in Germany, and, therefore, very important to Central and East Europe. The most eminent manufacturers and photographers in France have already sent notices for exhibiting. Italy, Russia, Sweden, Denmark, and Belgium will be represented in this exhibition, and we hope that the renowned English photographers and manufacturers will make use of this opportunity for acquiring a new circle of admirers and buyers. The Committee have prolonged the term of notice of articles to be exhibited till the 15th of April. You already know that our agent for the Exhibition is Mr. Trübner, 20, St. Dunstan's Hill, London.

The Photographic Society has determined that medals shall be granted to the best articles in the Exhibition.

Dr. Reissig's method of washing prints is now published in a small "brochure" which is very attractive. The method is founded on the application of centrifugal power. The prints, after fixing and washing, are put for some minutes into a wooden centrifugal machine, then removed from it, washed, and treated again in the engine, and this operation is repeated four times. The prints are washed completely in this manner in one hour.

Dr. Reissig has also found a new method for discovering the least trace of hyposulphite in the last wash-water:—Take a single galvanic element, of Bunsen or Grove, with silver plates on the anode and cathode, dip the two last into the water to be tested, and you will see, if any trace of hypo is present, a yellow or brownish appearance on the cathode. The proof is very fine, but the employment of galvanic batteries is disagreeable.

Another very simple method for discovering a trace of hypo is published by Mr. Grüne, of our Photographic Society. Mr. Grüne treats any finished negative with perchloride of mercury, and puts a piece of the film, coloured white in this manner, in the water to be tested. If hypo is present in the least trace, the film will soon be grey or black when the proof is warmed. The white film can be removed from the plate, and will keep a long time for use in a glass with water.

A good method for colouring negatives green or yellow, instead of intensifying in the ordinary way, has been published by Mr. Böhm. Pour into a concentrated solution of perchloride of mercury a solution of iodide of potassium till the precipitate produced at first is redissolved. This solution (already a long time known in photography) is poured over the fixed and washed negative. The negative will become at first black, then black-green, green, and finally yellow. The best colour is the green, it gives very fine prints. At last the negative is washed and varnished. Do you know the reason of the green colour in this case? It is the proto-iodide of silver, Ag_2I. I have now produced this very interesting substance as a green powder, and will describe it in my next letter.

The Simpsontypes are produced here now with great success by Mr. Bressler, who, with Mr. Kleppel, will exhibit some very fine specimens.

DUBLIN EXHIBITION.

Dublin International Exhibition, 1865.
Exhibition Palace, Dublin.

Sir,—The following persons having applied for space in the Photograpic Department of the Dublin International Exhibition, but, having neglected to give their addresses, the Sub-Committee would feel much obliged by your inserting this letter, in the hopes that it may attract the attention of the applicants, and that they may communicate at once with me on the subject, in order that they may receive their allotment papers.—I remain, dear sir, your's very faithfully,

J. J. Coghill.
Chairman, Sub-Committee, Photographic Department, Dublin International Exhibition.

22nd March, 1865.

T. Crow Twyman, Esq.
Edward Smith, Esq.
Mrs. C. H. Cameron.

THE WET COLLODION PROCESS WITHOUT THE USE OF THE NITRATE BATH.

Sir,—I have just commenced a series of experiments in order to arrive, if possible, at a certain and rapid method of working with wet collodion plates without the use of the nitrate bath.

I am nearly certain that, after a sufficient investigation, a process may be brought to perfection which will accomplish this most desirable end, to the great comfort of the tourist and landscape photographer.

I think that your process of working on paper with *collodio-chloride of silver* contains the germ, if I may so call it, of the process which I am desirous of bringing into notice.

I beg to hand you the first result I have obtained by embodying the following crude idea in a simple experiment.

The surface requisite for the formation of a photographic image by the wet collodion process is one composed of *collodio-iodide and bromide of silver with* free *nitrate of silver in excess.* This collodio-iodide and bromide of silver with the excess of nitrate might be formed in a *bottle* in the same way as you would form collodio-chloride for printing purposes; in fact, by adding *nitrate of silver* to any *bromo-iodized collodion that gives good results by the ordinary wet process.* The collodion thus sensitized might be poured on a plate, exposed, developed (in a dish) and then intensified by any ordinary method. Such was the crude idea. To work it into simple practice I took two ounces of Mawson's bromo-iodized negative collodion, and added 20 grains of nitrate of silver in about half a drachm of alcohol in the way now so well known. I left it for about half an hour to settle, and then tried a plate or two, *giving the same exposure as if for the ordinary wet process with the same collodion* for development, the plates were shot into a dish containing an old iron developer made with the ammonia-sulphate with a full dose of acetic acid. The image came out but slowly, having very much the appearance of a tannin negative under the influence of an alkaline developer. The plate was removed in about 10 minutes, washed, fixed, and then *redeveloped* with iodine and pyro in the old style.

The samples were taken with the full aperture of Dallmeyer's triplet, No. 1, on a very dull day.

The plates will only keep for two minutes, owing to the evaporation of the ether.

I hope to make more experiments, as I said before, and if you would like to see the results I shall be happy to forward them to you.—I beg to remain, your obedient servant, Nelson K. Cherrill.

Belmont Lodge, Lee, S. E.

[Our correspondent has been working in a direction often attempted, but never with sufficient success to demand much attention until Messrs. Sayce and Bolton devised a capital dry process last year. The examples forwarded now by our correspondent are, however, very good, by far the most perfect we have seen produced without a nitrate bath, by what may be termed the wet process. The great point is to establish the exact conditions of success. If our correspondent can produce such pictures as he has sent us, at will, he has accomplished a great and important fact. We hope he will continue his experiments, and let us hear further from him.—Ed.]

Photographic Notes and Queries.

Mr. Bartholomew's Dry Process.

Dear Sir,—If your correspondent "T" alludes to the alkaline gelatine process, I have used some time ago the usual iron solution to develop with, adding a few drops of silver solution and using directly, and then intensifying with pyro and silver, but I see no advantage over the plain pyro and water, followed by pyro, acid, and silver solution. The morphine silver bath is prepared with muriate of morphine one grain, silver bath eight ounces; dissolve the morphine in a drachm or so of hot water, and add it to the bath, then filter.

I have long been surprised that a separately constituted iron solution is thought requisite for intensifying, I find the same solution of ammonio-sulphate (fresh from the bottle of course), with a few drops of silver solution added, generally effective, and I think the best way of applying it, is by pouring it on and off, taking care to let it come on different parts of the plate every time, and dashing it rather than gently flowing it, if you pour it in a thin stream from a height on one place, the effect is seen plainly by a dense spot at the place of impact, seemingly penetrating the film better, and if this is judiciously done in a modified way, by dashing it alternately here and there on the plate, the same effect is produced evenly; and if, after fixing, the plate is wanting a little in density, acid pyro, and silver applied in diffused daylight give the requisite finish, but I seldom require it; I imagine that changing the iron solution for another of a different character, tends to disturb the continuation of the chemical action begun.—I am, sir, yours &c. Wm. Bartholomew.

Albumen and Honey.

Sir,—Having to make use of a mixture of equal parts of honey and albumen, diluted with water, to coat glass plates' I find a great difficulty in getting an even or smooth surface, the mixture appears to flow over the glass very smooth and oily, but upon drying becomes covered all over with sandy-looking spots, or small globules, which seem to form as the plates dry, although filtered previous to using it. I shall take it as a favour if you could inform me, through the Photographic News, how to get rid of this annoyance.—Yours, a constant reader, G. W.

[We presume that the honey in drying tends to crystallization. Can any of our readers help our correspondent?—Ed.]

Talk in the Studio.

An Umbrella Camera Stand.—Mr. Aldis has designed a new form of camera stand, of an ingenious character, combining the features of an umbrella, as well as a camera stand. In some respects it is like the ordinary tripod camera stand, but the legs are made rigid by three stays or ribs, fitted somewhat like those of an umbrella, but with a binding screw to keep the legs rigid at any expansion. When stretched out and covered with a properly fitted piece of Macintosh cloth, which is provided, the tourist is furnished with a protection against sudden showers; and it is contemplated to extend this arrangement, so as to permit a tent to be improvised with it, for the occasional development of a plate when in the field. A central rod, sliding up and down in a socket, gives great range as to the height of the camera; and a ball and socket joint for the camera to rest on, allows it to be placed at any angle. The whole affair is very ingenious; but whether it will be sufficiently rigid for other than a very light camera we are uncertain.

Collodio-Chloride of Silver on Opal Glass.—In our last we referred to two fine specimens of Mr. Swans' process we had received, one on paper, and one on opal glass. From a subsequent communication from Mr. Swan, we learn that the picture on opal glass is by our own process with collodio-chloride of silver, with which he has been experimenting. We had already satisfied ourselves by one or two trials of the applicability of the process in that direction; but we had not seen anything approaching in beauty to the specimen forwarded by Mr. Swan, which is rich, deep, and vigorous in tone, of a very fine purple, exquisitely delicate, and full of half tone.

Royal Patronage for Diamond Cameos.—On Saturday last Messrs. Window and Bridge were honoured with sittings from their Royal Highnesses the Prince of Wales, and Prince Alfred for diamond cameo portraits, and also for full length card pictures, singly and grouped. The sitting was very successful, and some of the best portraits we have yet seen secured. We understand their Royal Highnesses expressed the highest satisfaction with the results.

"Quinque Gems."—Mr. Palmer, a skilful photographer, of Stonehouse, Devon, has introduced another modification of the Diamond Cameo idea for portraits. He arranges five busts on the card, a right and left profile, a right and left three-quarter face, and full face, thus securing five distinct views in order to comprehend every phase of his subject. They are mounted cameo-wise, each cameo having an ornamental border. Those we have seen, are exceedingly fine and effective. Mr. Palmer, we understand, works with a very weak silver bath, containing organic matter, which he finds gives very brilliant prints, and is at the same time economical. We hope to lay some further details of this bath shortly before our readers.

Photographs on Canvas.—The gentleman just referred to (Mr. Palmer of Stonehouse), has submitted for our inspection some examples of his method of enlarging on painter's canvas, for oil painting. Nothing can exceed the excellence of those we have seen, they are well defined, round, full of detail, vigorous, and of capital colour. They appear to be produced by the solar camera, but Mr. Palmer is not prepared to publish details, as he states he is prepared to enlarge for the profession, on very reasonable terms, he does not feel called upon to give away, and thus raise up competitors to himself, the results of the capital in time and money he has invested, in perfecting his process. Messrs. Ottewill, Collis and Co., are agents for these enlargements, and for the "Quinque Gem" cards, which are registered.

To Correspondents.

⁂ Collodio-Chloride of Silver.—In our paper read before the Photographic Society there is an inaccuracy in the statement of the best formula. The quantity of chloride given for two ounces of collodion is that which should be added to one ounce. For clearness we will repeat the formula. Take

16-grain alcoholic solution of nitrate of silver 1 oz.
Ether ... ... 1 „
Soluble cotton, *quantum suff.*

and then, when the cotton is dissolved, add

16-grain alcoholic solution of chloride of calcium ... ... 1½ drms.

Each ounce (or rather, each 8¾ drachms,) of collodion will now contain 1½ grains chloride of calcium and 8 grains of nitrate of silver, and each grain of the chloride, requiring, giving the statement in round numbers, 3 grains of nitrate to decompose it, a fraction more than 3 grains of free nitrate will remain in each ounce. The formula may possibly admit of modification without disadvantage; but this is one with which we have obtained the best results with ordinary negatives.

J. B. B.—Undoubtedly, if you wish to suceced, you must use the formula as Dr. Vogel gives it in our columns, employing nitric acid, and not persulphate of iron. We did not refer to the subject again because we thought it unnecessary, having once clearly stated the case. We adhere distinctly and emphatically to what we first said, that with "persulphate of iron, free from nitrous acid, no such result [the instantaneous production of a permanent blue colour] takes place," the slow liberation of iodine, and the production of the resulting blue, would be of no use in Dr. Vogel's test, and, therefore, discussion on that point is beside the mark. We, of course, saw the allusion to a letter from Dr. Vogel expressing regret, &c.; but we thought the artifice too transparent for notice. Dr. Vogel received a letter from the writer of the article in question, and, of course, replied to it formally and politely, as any gentleman would; he has since, in a letter to us, expressed his surprise at the use made of his words. We felt no surprise whatever. 2. In point of principle it is similar to the usual method of precipitating with chloride of silver, but it assists the eye in judging of the exact moment of precipitation, and thus aids in securing greater accuracy. Pure iodide of potassium is imperative. 3. We have received the apparatus from Mr. Trübner, but have not yet had time to test it.

S. G. Payne.—Thanks for the examples of double and triple portraiture. See our article on the subject. We shall be pleased to see the other groups to which you refer.

A H.—Much depends on the kind of work. The double stereoscopic lenses will give the most rapid results, and should be used for street scenes, &c. Quick-acting single stereo lenses will perhaps give the best results for instantaneous landscapes or sea views.

P. B.—If the plate were perfectly clean, the probable cause of the gelatine running in greasy-looking lines is the use of too much alcohol. Try it without alcohol at all.

G. R. Gill.—Thanks for the charming card. We will see that it is registered if you send the form, &c. We have added a note to Mr. Robinson's article, mentioning that you have modified the shutters. Your diagram came to hand too late to be engraved with the others.

C. G. M.—The qualification for becoming a member of the Amateur Photographic Association consists in being an amateur photographer, and a willingness to abide by the rules and conditions of membership, details of which you may obtain from the Secretary, 12, York Place, Portman Square. The advantages to be derived from the Amateur Photographic Tourists Club consist chiefly in the facility for association in field work, and all the pleasure and help which such association brings, and a facility for exchanging the results of such labour.

T. Revon (Gray, Haute Saone).—The use of acetic acid is generally prescribed for the nitrate bath in dry processes in which organic matter is employed, on account of the action of nitric acid on organic matter. If plates for the tannin process have a preliminary coating of gelatine it is perhaps well to use acetic acid; but if plain glass be used, or a coating of india-rubber, and the collodion be bromized or bromo-iodized, it is better to use nitric acid, as a bath with nitric acid is found to work best when a bromide is present. A neutral bath is best for sensitiveness, but it is more apt to fog; on the whole, a very slightly acid reaction with nitric acid is best. 2. We have not sufficient experience of French albumenized papers to speak with certainty as to the comparative excellence of them compared with that of English makers. Both those you name of the English maker are good, perhaps No. 1 is best. 3. Some judgment must always be employed in focussing a landscape; but a safe rule with all kinds of lenses, is to focus for the objects of principal importance, which will generally be in the foreground, and then, if necessary, get definition in distinct objects by decreasing the size of the stop. Lenses of short focus will have the greatest depth of focus, that is, they will define the greatest number of planes, provided always that the camera be planted as far from the objects as it would with a lens of longer focus. You will find the article to which you refer on page 513 of our last volume. As a rule, a single lens has more "depth of focus" than a portrait lens, because it cannot be corrected so accurately for positive spherical aberration, a defect in itself, but one which gives depth of focus. The rules laid down in reference to depth of focus in the article to which you refer will apply to either single or double lenses.

P. Le Neve Foster.—There is an error in the figures, and we are obliged to you for calling our attention to it. The proportion of chloride given for two ounces is meant to be added to one; that 1½ grain of chloride to about 7½ or 8 grains of nitrate. Our prints are generally a rich rosy purple readily bronzing with shadows. It is possible that experience may suggest many valuable modifications in formulæ. That which we prefer we have given in a corrected form above.

Scum.—A tendency to curdiness, when the developer is applied to the plate, sometimes arises from the use of hard water for the developer, which, when it comes into contact with the silver, throws down a little chloride or carbonate of silver. A scummy appearance quickly accumulating on the developer may arise from insufficient acid, and is often due to some peculiar quality in the collodion.

Goose.—We have not tried it, and cannot say. 2. The circumstance you mention arises out of a foolish, and we think unfair desire on the part of some dealers to get a reputation for cheapness by underselling their neighbours. If in the case in question one article is sold without a profit, the price of some other article not so easily detected will probably be proportionately increased. 3. Probably 1, 5, 6, or 9, or a mixture of them. 4. You may evaporate at a gentle heat. 5. Your gun-cotton, which smells of sulphuric acid, may have been very imperfectly washed, or it may have become somewhat decomposed. Wash it with water containing a few drops of ammonia. 6. Yes: a decided advantage over the shorter focus. 7. We prefer those of the first named maker. 8. Your exposures with the lens stop you name are unusually long. With a short focus lens, you must use a moderately small stop to define a card all over; but the notion of focussing 15 inches behind the sitter to get a sharp picture is something preposterous. You should focus on the eyes, and unless your lens will give you a sharp image doing that, there is somthing very wrong somewhere. It ought never to be the case. Let us see some of your results, and we can judge better. Cold weather, of course, retards operations, and if your chemicals have been in stock all the winter, it is quite possible that some of them are seriously out of order. 9. If you allow your waste developing and intensifying solutions to accumulate in one vessel, a great part of the silver will be thrown down as a metallic powder, but if you allow the cyanide to run into the same vessel, it will prevent the reduction, by keeping the salt of silver in solution. 10. If you allow all to go into one vessel, add the contents of the old hypo solutions, and recover as a sulphide. 11. The varnish you mention is very excellent. 12. There is no effectual method of restoring old collodion to its original condition. It may be improved, but it will not be as good as at first.

L. R.—It is not easy to prepare collodio-chloride of silver successfully with the plain collodion ready made; but you may proceed as follows:—Take the plain collodion, which, as supplied generally, requires one ounce of iodizing solution adding to three of plain collodion. Instead of this iodizing solution, add a similar proportion of alcohol, in which has been previously dissolved from 25 to 30 grains of nitrate of silver, a few drops of water may possibly be required to aid in getting this quantity of nitrate dissolved. Next dissolve four or five grains of chloride of magnesium in a drachm of alcohol, and add to the collodion, and you will have a preparation which will probably work well, if the plain collodion were of suitable character. As to whether it is worth your while to experiment in this direction, much must depend on your own taste for such work. If you merely wish to work it commercially, it may not be worth your while until, as you say, others have worked out the formula, and proved the commercial value of the process; but at any time when you wish to take up a new process of any kind you must calculate on a little experimental work before you attain success. 2. Regarding the subject of "pocket photography," as it has been phrased, we look on the matter rather as a toy, than a thing likely to be of much use to a professional photographer. Field work with wet photography, carried out to any available extent, commercially, requires a dark box for small plates, say seven by five, or a dark tent for larger plates. 3. The Wothlytype does not yet seem to be free from uncertainty, unequal and irregular results being common. But, as we have said, every new process requires patient experiment before certainty can be obtained.

An Irish Blunderer.—Your interest in photography is a good earnest of success if you persevere, and where we can aid you with advice we shall do so gladly. So far as we know, you can get genuine lenses from the second-hand dealer you name, and if you wish to produce stereoscopic pictures and some of a larger size with the same camera, you may do so up to seven by five with the No. 1 triple you name. Of course it would be much better if you had anyone in London who could select and purchase for you. Our own manifold duties and position preclude the possibility of our aiding you in that way. The simplest plan of producing transparencies for the magic lantern is by camera printing with wet collodion, as described in our Year-Book for 1864, by Mr. Blanchard. The proportion of bichromate recommended by Mr. Swan is 1 ounce of a solution containing 1 ounce of the salt in 4 ounces of water, in 8 or 10 ounces of gelatine solution containing 4 ounces of gelatine and 2 ounces of sugar in 16 ounces of water. Mr. Woodbury's proportions we do not know, but they are probably similar; we hope to publish them shortly. Do not hesitate to write on any special point on which you require advice.

G. C. S.—You may use the solution without crystallizing. If you have not had experience in such matters, you may have some little difficulty in crystallizing the salt. It should be evaporated with gentle heat, and the crystals removed. If merely left at an ordinary temperature, it would deliquesce, absorbing moisture from the atmosphere.

C. W. H.—We are obliged by your congratulations and kind expressions. The lime bath we use consists of 1 grain chloride of gold, 1 grain chloride of lime, and 5 ounces of water, used a few days after mixing, or a few hours after, if made with hot water. Fix in hypo 1 ounce, water 10 ounces. Wash in several changes of water for two or three hours.

Hibernicus.—With a good light, well illuminated objects, and good chemicals, you may get instantaneous pictures with the lenses you have, using the largest stop; but the double stereo lenses are decidedly more rapid.

Landscape Photography.—C. C. writes to say, regarding his communication on page 138, the nitrate of silver bath should have been stated at 35 to 40 grains to the ounce of water, and not 55 grains. The bromide of ammonium bath requires to be occasionally filtered to remove the particles which form in the bath of bromide of silver.

E. E. Dyson.—We prefer to keep gun-cotton in a jar or wide-mouthed bottle loosely tied over with paper.

F. Williams.—No. 1 is, we believe, a very good landscape lens, but it is not suited for interiors or architecture, because straight marginal lines will be curved in the picture. No. 2, we should say, will best suit your purpose, especially as to angle. 2. Both the makers you name will examine a lens, and verify their own work; so that you will be tolerably safe in buying their lenses second-hand.

A. B.—It is possible that the collodion is in fault, to ascertain which try another sample; but it often happens that rain water contains a little organic matter, which would injure the bath. If, on trying another collodion, the same faults are present, add a few drops of a 10-grain solution of carbonate of soda until a permanent turbidity is present, then expose the bath for some hours to bright sunlight, filter, add a drop or two of nitric acid, and try again.

W. W. S.—With the three lenses you name you may, of course, take views from the same point, the result will be pictures of three different sizes, with greater depth of definition in the smaller ones. 2. Yes, by using a small stop. 3. You may make size yourself by soaking glue in cold water, and then dissolving by heat; but you can more easily get it from the oil shops in the form of a jelly—ready to be dissolved or made fluid by heat.

J. S.—If the pictures were, as you state, spoiled or imperfect copies, you did yourself great injustice to allow them to be sent out as examples of your ability. We offered an opinion on their merit without any knowledge of their origin. We are sorry that such expression of our opinion should have been injurious or disappointing to you. We examined some half dozen prints, and said there was a want of careful manipulation and uniformity of quality about them. You now send us one print, and ask us to point out in what the want of "careful manipulation and uniformity" consist. Want of uniformity of quality in half a dozen prints may consist in some being too weak, and some too hard, but one print can only possess one quality. That you send is not carefully vignetted; more of the figure being cut off at one shoulder than from the other; the face is lighted with one uniform diffused light, without one point of high light or deep shadow, and it is consequently wanting in brilliancy. You must remember that our opinion would be of little value if not given faithfully. 2. In photographing a building, it may be, at times, necessary to tilt the camera to get in the whole; but in such a case, a swing back should be used to keep the sensitive plate parallel with the building. 3. The yellow varnish for dark room windows consists of raw sienna, and orange chrome, ground up with japanner's gold size turpentine, and a little patent driers. Details are given in our last Year Book.

Nassau Jocelyn.—If you use absolute alcohol you may add about a drachm of water to each ounce without making it weaker than ordinary rectified spirit; this will enable you to get sufficient nitrate of silver dissolved without injuring the physical qualities of the collodion. See the rectified formula given above. We have obtained good prints on ordinary photographic paper, but either a harder sized paper or one prepared with a surface of arrowroot is desirable. So far as we know, all the chlorides soluble in alcohol will answer. We have used chiefly those of calcium or strontium; the latter is very easy to dissolve. You will find, we think, the method of preparing the collodio-chloride given in our paper (and corrected above) the best.

S. Corrigan, Madhapoor.—As you will have ascertained from last week's News your letter had got unfortunately mislaid, and hence a delay of some weeks in attending to it. The numbers and Almanac have been now forwarded. Thanks for the prints. The chief fault in the cards is the want of one direct light, and the presence of too much diffused light, giving uniform illumination, and thus producing some want of brilliancy and relief. In many instances the pupils of the eyes are contracted very much as though directed to some bright light. Always allow a sitter to look at something dark, and, if possible, away from the light. The views are very interesting, and many of them very good. No. 1 is especially a fine piece of atmospheric photography. "The Oaks" is a piece of good work for a lens of 6 inches focus, but, as you will observe, there is not more than 4 inches of satisfactory definition. Regarding a background see recent article in our pages, but remember to read umber for amber. We shall probably refer to the pictures and details regarding them again. The specification you quote is that of the globe lens, of which you will have seen accounts in our pages. We do not consider it equal to the triple. Your other requests shall receive attention.

W. H. Warner.—Received the print; but no communication.

Charles Rickets.—The Almanac and News have now been forwarded. We were amused with your nomenclature of the canine family.

Several articles are compelled to stand over. Several correspondents in our next.

Several Advertisements are compelled to stand over from want of space.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 344.—*April* 7, 1865.

LIBRARY

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PORTRAITURE.

We call the attention of our readers to two articles in our present number, both having reference to this subject, and containing very important hints and suggestions; one by the Rev. A. A. E. Taylor, on "Expression," and another by Dr. Vogel and Herr Petsch on "Pose and Lighting." The perfection to which the wet collodion process has attained in its manipulatory and chemical details has for some time past rendered clear, brilliant photography in portraiture the rule rather than the exception. But we are painfully impressed from time to time with the imperfections in likeness, and in pictorial effect, which pass current in photographic portraiture. We do not, in making this remark, revive or join in the old, and now we hope worn-out lament, on the decadence of miniature painting brought about by photography. The worst examples of photography are rarely more untrue, if they are less pleasing, than the old-fashioned miniature, excepting always those painted by artists of great ability. But we compare photographs by a higher standard than this, and demand higher art qualities than the hack miniature painter of old ever thought of. Above all, we hold it important that the portrait should be like. In the "Journal of a Tour to the Hebrides" we find some excellent remarks by Dr. Johnson, on this point in portraiture. Boswell having asked him whether he perferred in portraits fine painting or perfect resemblance; "Sir," said the Doctor, "their chief excellence is being like." Boswell further enquiring whether this was equally important of ancestors, whom one has never seen, as of contemporaries: "Sir," rejoined Johnson, "it then becomes of more importance that they should be like. Truth, sir, is of the greatest value in these things." Macqueen added, that to be indifferent about resemblance in a portrait if it were well painted, was equivalent to disregarding the truth or falsehood of history if it were well written. Good definition, faultless manipulation, brilliancy, delicacy, good composition, all are important; but perfect resemblance to the original is most important of all. The securing of this resemblance depends primarily upon suitable lighting, and next upon natural expression; and it is for this reason we direct the attention of our readers to the two articles we have mentioned referring to these subjects.

In the article on lighting, the engravings of a head lighted on four different principles, very aptly illustrate the effect of lighting on the question of verisimilitude, or likeness. Not only are different pictorial results produced, more or less pleasing or unpleasing, but the whole form and character of the features seems changed so much, that the writers very properly remark that it seems difficult to believe that they are all portraits of the same person. This is marked enough in the engravings, and in the original photographs this dissimilarity appears even more striking. The controversy which was raised a year or two ago as to the value of front lighting might be very easily settled, we fancy, if the subject had required further elucidation, by an examination of these photographs. By far the most unpleasing picture is that lighted altogether by means of a direct front light; the face looks flat, heavy, and fish-eyed. Of the three errors in lighting which are illustrated, that in which direct side light is employed appears least unpleasant, either pictorially, or in the effect of life and spirit in the face. A high side light, with reflecting screens, often gives, indeed, exceedingly pleasing pictures. Amongst some very charming examples of the portraiture of Herr Petsch, now before us, which admirably illustrate his competency to write on the subject of lighting, that which charms us most is a portrait of a lady, in which very skilful use is made of the direct side light. The figure is gracefully placed in a standing position, presenting a side view of the figure and front view of the face. It is lighted with a soft subdued light coming from the top and front, and a strong direct side light. The greater portion of the face is thus rendered in a delicate mezzotint, whilst one side is just touched with a brilliant line of light which brings the face, shoulder, &c., out, in beautiful relief, quite away from the background. The face is one which, imperfectly lighted, or without expression, would be heavy and unpleasing; but here, with a sweet expression and skilful lighting, it makes a very charming picture.

The management of expression is as difficult as it is important, and is one for which few rules of general application can be given. A courteous, cheerful, gentlemanly bearing in the operator, and a perfect understanding of his work, will do much to secure the best results. The least possible of arrangment and re-arrangment of the position of the head, hands, &c., of the sitter; the least possible delay between the final arrangement and the exposure of the plate; the least possible formality about the whole proceeding; and a mode of going about the whole business, which will inspire confidence in the sitter, will do much to secure a good expression The suggestion in Mr. Taylor's article as to getting the sitter interested in the object at which he must look, is good within certain limits, but there is some danger that in such case the eye will wander over different parts of such object, and the expression might moreover be very apt to vary slightly as different phases of interest were felt. The "fair featured woman with the gift of graceful conversation" suggested, might no doubt contribute much to the improvement of expression in portraiture, and opens out, moreover, a new field of employment for pretty girls who can talk well, and will study the art of inducing a pleasant expression on faces in positions which often induce a painful and nervous self consciousness. The other suggestions made in the article on "Expression" are well worthy of careful attention, and we commend them to our readers. We repeat, the time has passed when merely spotless and brilliant photography will command admiration: truth of likeness, and beauty of pictorial effect, must be added to the perfect photography. To secure these, a comprehensive mastery of position and composition, of lighting and chiaroscuro, and of expression are necessary. These should be the study of every portraitist, who would be truly a master of

"———— The art divine,
That both creates and fixes, in despite
Of death and time, the marvels it hath wrought."

◆

OUR COLLODIO-CHLORIDE OF SILVER PRINTING PROCESS.

Mr. Sutton, in the last number of the *Photographic Notes*, makes the following remarks on the process:—

"At the last meeting of the Photographic Society, Mr. Wharton Simpson read an interesting paper on his Collodio-Chloride Printing Process; modestly remarking that, 'should it be found on experience that collodion is not desirable in printing on a commercial scale, this is, at least, a process which will be found useful to amateurs, and for many incidental purposes;'—a statement to which no objection can be made. The process consists in adding to plain collodion one and a half grain of chloride of calcium and seven and a half grains of nitrate of silver. This forms a sort of emulsion, and when applied to paper it may be at once exposed under a negative. The picture is said to be entirely in the collodion film; which Mr. Simpson explains by assuming that although the spirituous solvents sink into the paper, yet the coarser particles of the emulsion are filtered out, as it were, and remain upon the surface; an explanation which, if the fact be true, is probably true also. With respect to the extraordinary sensitiveness claimed for this process, we fear there must be some delusion. We have always found plain paper *rather* more sensitive than albumenized,—and a mere mixture of chloride and nitrate of silver exposed in a watch glass more sensitive than either,—the fact appearing to be, that according as you introduce vigour-giving organic matter, you reduce the sensitiveness. Now if Mr. Simpson's prints are as vigorous as is described, that must surely be incompatible with extreme sensitiveness—unless the prevailing notions on this subject are a fallacy. We would suggest to those who experiment with this process to add to this collodion some animal fatty matter, as well as some of that saline matter which exists in perspiration from the skin—and not to add the nitrate of silver until they are ready to use the mixture. Castor oil has been recommended as an addition to the Wothlytype mixture, but we think almond oil would be better, because the latter is a drying oil, the former not. What the most suitable animal fatty substance might be we cannot say. It is not improbable that the collodio-chloride process may receive some more useful application than that of printing upon paper. It would be out of the question for fine engraving upon wood; but perhaps for printing upon hard white enamelled surfaces it might be useful; unless, as we strongly suspect, camera-printing will be found the best for that purpose. With respect to the advantage of no silver remaining in combination with the collodion in the whites of the print, we think that a very questionable one. Experience has sufficiently proved that no risk of fading occurs from the silver in the whites of an albumen print; and the probability is, that in that case the silver exists as a double hyposulphite of silver and soda, which is a perfectly stable salt. The fact is, that good silver prints upon albumenized paper are permanent both in the blacks and the whites. The fading of such prints has become a thing of the past. There are enough practical troubles in photography which stare one in the face, without going out of one's way to invent imaginary ones. In the worst days of fading, albumenized prints held their ground quite as well as plain paper ones."

[The fact that a mixture of chloride and nitrate of silver alone is more sensitive than plain or albumenized paper, should be an argument in favour of the sensitiveness of the collodio-chloride, which is just such a mixture on an inert vehicle. The insoluble silver compound which remains in the whites of albumenized prints is believed to be albuminate of silver, and to be slightly affected by light. We have no disposition to exaggerate the instability of albumenized prints; we have always claimed for them, if properly produced, a very large share of permanency.—Ed. Photographic News.]

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

The Weather — The Simpsontype — "Doubles" — The "Portrayal of the Graces of Childhood"—Competition—Decay of India-Rubber and Gutta-Percha—Coming Exhibitions—The Societies.

The weather is a topic to take up when every other matter for comment fails. I have not this excuse in the present instance, for the month has been unusually full of interesting photographic events, but the weather is in such an exceptionable state that it demands notice. As I write—on the 28th March—a north-east hurricane is driving a heavy snow storm with such violence that it is dangerous to go outside the door. Does anybody ever remember such an anti-photographic winter and spring? From November to February there has scarcely been enough light to enable the photographer to see the image on the ground glass; to get a reasonably good picture has been impossible. This absence of light, the staple commodity in which photographers trade, must have been felt very severely by those who have not been able to afford to rest during the winter, and what is perhaps worse than a temporary loss of business, is the loss of reputation that must be sustained by those who, not liking to turn away the seldom seen customer, take pictures in the dark, of which they must afterwards feel ashamed, and which remain a standing judgment against them.*

The Simpsontype has been brought forward prominently this month by its inventor, whose paper on the subject, read before the last meeting of the Photographic Society of London, achieved one of those genuine successes which are becoming, probably because novelties in the art are not so plentiful now as they have been, rarer every year. The meeting was unanimous in praise of the beautiful prints exhibited as specimens of the results of the process, the inventor not being content to exhibit one or two, perhaps exceptionally good proofs, had, despite the bad weather, prepared about fifty specimens, all showing the excellence of the process, and fully justifying Mr. Mayall's remark that one of the prints he had in his hand was the finest he had ever seen by any process.

After witnessing the enthusiasm with which the discovery was welcomed at the parent society, it was an interesting sight to see the efforts made in a certain quarter, at another meeting, at which the prints were afterwards exhibited, to sneer the process down, in quite a friendly way of course. The Chairman did his best to throw cold water on the process, by suggesting, or rather asking the meeting to infer, that the prints would not boil! But his frivolous objections called forth sufficiently unmistakeable replies, in favour of the process, to have convinced even that gentleman that he had unwittingly assisted in making the process more popular, and which must have been as gratifying to the inventor as it was disappointing to the gentleman who occupied the North London chair for the last time.

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* Since writing the above, we have had a few of the most delightful and genial spring days that could be wished, let us hope they will assist us to forget the hardships and losses we have sustained during the dark months, remembering only the lessons they have taught.

Those Corsican-brotherish pictures which, wanting a name, have just received that of "Doubles," still attract attention, and are becoming more popular, and the method of producing them better understood every day. The "Old Photographer" has had his portrait done in this way, but he cannot persuade his friends who do not understand how it is done, so impossible does it seem, that both the images represent himself. How is it that only one of the two images is like the individual represented? The least change of expression makes another man of the second figure, and at best they only appear like "the counterfeit presentment of two brothers."

The difficulties in the way of taking portraits of children are always considered to be very great, they move, they don't always look, when they are sitting for their portraits, like the little darlings they are said to be at home; and when the best is done that can be done, mamma is not easily pleased, and declares that the picture is a gross caricature of her beautiful boy. Photographers generally look upon children as a nuisance, and frown at the little dears when they are carried into the studio; but for all that it is a very enticing thing to parents when photographers, who cannot get custom otherwise, advertise—after the manner of the American quack doctor, a little episode in whose practice is related by Mr. Sala, in his lately published book on America,—that they are "Stunners at Children." Here is a cutting from an advertisement of a provincial photographer, who does not seem to have the objection to the "Portrayal of the Graces of Childhood" usually entertained by his brethren. "Having devoted a great portion of his artistic career to the Portrayal of the Graces of Childhood, he hopes to prove successful in the same pleasant occupation by means of photography."

I am grieved to see that professional photographers, in the heat of competition, are ruining the business. The principle of taking one carte for one shilling is being introduced into London. It is well known that it is not possible to take a negative, print it, mount the print, and deliver it to a customer for that sum; and the only object of advertising to do so is to get the chance of getting a customer in a mode scarcely fair to the profession. But I feel that it is of no use talking about morality to photographers who cut each other's throats in this manner, so I will ask them instead to look at the state of photography in Brighton, where the shilling business has had its flash, and is now dying out. In Brighton there are, or were, dozens of photographers, who, to take the custom from their neighbours, no matter at what cost, advertise to do cartes at a shilling for the first copy, the choice of two, and five shillings a dozen for duplicates; the effects of this ruinous competition are now becoming evident, and shutters are going up. The same results are occurring in other parts of the kingdom.

Coming photographic exhibitions are as plentiful as blackberries in autumn; enough to satisfy the most eager desire for publicity. Those of Paris, Berlin, and Dublin will open in May; and the council of the Photographic Society of London have announced that they will get one up in time to open early in that month, apparently with every chance of a greater pecuniary success, or rather with less loss, than have attended former attempts of the kind. The demands for space in the photographic department of the Dublin International Exhibition have been much greater than can be supplied, which shows the interest photographers take in this contest. Exhibitors may feel quite sure that although it will not be possible to hang all their contributions their works will receive all the attention possible from such an able manager, and enthusiastic admirer of the art, as the chairman of the department, Sir Joscelyn Coghill.

At the London Photographic Society, the chief interest was centred in Mr. Simpson's paper, which has already been mentioned. Mr. H. Cooper, junior, also read a paper on "The Wothlytype Process," which would have attracted more attention at any other time.

The paper of the evening at the South London Meeting was by the Hon. Sec., Mr. Howard, "On some of the Defects in Landscape Photography," in which he humorously argued that as we had now arrived at approximate perfection in manipulation, it was time to advance a little in other ways, and that we should apply our knowledge to something better than the production of the "clean, try-and-see-if-you-can-find-a-fault-in-me style of thing," that we are always perpetrating. It does seem strange that providing a negative is spotless, no matter how bad the subject and treatment may be, photographers should be content to fancy they had arrived at the perfection which is really so very far distant.

A discussion took place on "Doubles," but nobody arrived at the true method of taking the two figures with clasped hands, the mystery of which has been cleared up in a paper in the News for the 31st March, by Mr. H. P. Robinson. Some curious photographic copies of microscopic drawings of the human breath in health and decease were exhibited by Mr. How, which occasioned a discussion more fitted for the medical society than for one devoted to photography.

The annual meeting of the North London Association took place this month, the report shows the Society to be in a very flourishing position, having had a large addition of members during the year. The rules were altered to admit of the election of four vice-presidents instead of two as formerly, which will save the members the monotony of being presided over continually by the same chairman. The number of the committee also was increased. A discussion on the "Simpsontype" also ensued, to which I have already alluded. Mr. Bockett read a short paper on "Binary Photographs," and exhibited a camera for their production. A number of Mr. Gill's "Doubles" caused much amusement.

At the meeting of the Photographic Society of Scotland for February, Mr. Tunny read a valuable paper on a "New Collodion Printing Process, applicable to Vitreous, Enamelled, and other Surfaces." He prepares collodion with chloride of cobalt, instead of with an iodide. A plate coated with this is dipped into a 40-grain nitrate of silver bath, acidulated with citric acid, washed and dried. It is now laid on the negative and printed in the usual manner, toned if necessary, and fixed with hyposulphite of soda. If the print have been under-exposed, it might be developed with pyrogallic acid. Mr. Tunny anticipates that the process will be of great use to the printers of composition pictures, and to the art of photo-diaphanie. It would also be invaluable for lockets and brooches on opal glass. At the meeting for March a paper by Mr. Sutton was read, "On the Glass Room and Portrait Camera," in which he advocated the use of tunnel-shaped rooms. He argued that it was impossible to get a portrait that should be like the person represented in the old ridge-roofed studio, and that it was "morally wrong to go on thus deluding one's fellow creatures!" The subject is one upon which I suppose one may disagree without quarrelling and as I totally disagree with Mr. Sutton's idea on this subject, and believe a properly built ridge-roof glass-room to be the best possible form for all purposes, I rejoice that the meeting considered the old shape much the best. The medals for the best pictures exhibited at the late exhibition were distributed at this meeting. At the Edinburgh Photographic Society, the chief object of interest was the exhibition of Mr. Chadburn's new lantern for opaque subjects. This instrument is a great improvement on the old magic lantern, and besides the usual transparent slides, will show solid objects, such as botanical specimens, feathers, watches, &c. As a necessary consequence of something good being introduced, there is somebody ready to say it is not new, and in the photographic section of the Manchester Literary and Philosophical Society Mr. Dancer read a paper entitled "The Opaque Lantern not new," in which he had the pleasure of proving that something like it had been used eighty years ago, but had gone out of use. As Mr. Chadburn did not claim the invention, and as Mr. Dancer certainly did not invent it, I cannot very clearly see that anybody is any better or worse for the information. The Manchester Photographic Society had, as usual, a conversation on collodio-albumen and other dry processes.

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THE USE OF PHOTOGRAPHY FOR PROCEEDINGS IN CRIMINAL CASES

Report upon Privy Counsellor Odebrecht's Article on the Subject.*

BY FERDINAND BEYRICH.

Photography, which, during its existence of 25 years, has extended itself throughout the entire world, has forced itself into the province of law. We shall endeavour here to consider the advantages, or rather the necessity of its use in criminal procedures.

A faithful representation of a human being, or of an object, always renders the recognition of the same more certain than the most accurate description in words; such a faithful representation photography gives us, and on this fact, is based its application in matters of law. We will illustrate this by separate examples.

1. Living Persons.

Even now, persons who have been arrested are, in especial cases, photographed, on the one hand, to ensure re-capture in case of escape; on the other hand, to recognize professional rogues, who, on being re-arrested, change their names. It is most earnestly to be desired that a photograph be immediately taken of every criminal in the police court, and a copy be deposited in the police court, a second in the *official records*, and a third in the jail. Such a representation is also advisable at the liberation of the criminal, inasmuch, as during his imprisonment his exterior has not a little changed. Such pictures are of especial advantage in investigations where the exhibition of the photograph would render needless the production of witnesses to indentify the criminal.

2. Dead Bodies.

The most circumstantial description of a dead body as it is generally taken, whenever one is found, is an imperfect means of recognition. One photograph would say more here than a thousand words. How many bodies are found, described and buried according to law, without any one's appearing as claimant, while the real relatives often receive no knowledge of the fact, and live for years in anxiety about the "absent one." The reproduction of the dead body is further serviceable for investigations for the discovery of signs of violence committed (murder, &c.), also in the case of those who have been shipwrecked. The ocean often casts bodies on the shore, the lineaments of whose countenances are indeed not recognisable, but whose stature and clothing often offer useful hints. In case of murder, the photograph of the surroundings, of the room where it occurred, of the tree where the deceased hung, &c., is of especial importance.

3. Application in rendering the appearance of Objects to the Eye in Civil and Criminal Cases.

In all cases where the court requires an "approximate description of the objects and of the surroundings," the application of photography is to be preferred before all. The following may serve as examples for the application in criminal cases:—

a. Railway Accidents.

Here an accurate decision of the culpability often entirely depends upon a particular description of the ruins and injuries, and here photography is the more invaluable in that it performs its work in a few minutes, whereupon the committee on repairs can be immediately notified; whereas, by the time required for the common legal observations, a delay of days might be occasioned. In remarkable cases of trains being thrown from the track, and of collisions, several railway directors already are accustomed to have photographs taken.

b. Photographic Representations of Inundations and the Damages to Buildings arising from them.

c. In Incendiarisms, Explosions, &c.

Where now an "approximate description of the objects or surroundings" is required, how much more invaluable, on the contrary is a photograph. How important is such a representation for insurance companies.

d. In Burglary and Street Robbing.

Here the magistrate can fix the scene in his mind, the photograph giving him the means, and can so present it to the witness.

e. In Forging of Deeds.

Here the photograph of the deed in question, on the one hand, and of the personal handwriting of the accused, on the other, is of great importance for distribution among the witnesses. Equally important are representations of original attests, &c.

The time may not be far distant when photographs of original attests shall entirely supplant the certificate of genuineness.

f. In Civil Processes,

photography will be of use in boundary suits and in building affairs, though the representation of the building or of the country, in which case the taking of proof upon the spot can often be dispensed with.

4. Application in other Processes at Law.

Here belongs the accurate representation of stolen goods, which otherwise must be for a long time kept from their owner, as well as of objects of importance which have been found where, in case they revert to the finder, the law prescribes an accurate description.

Equally worthy of recommendation is the copy of such objects as are generally kept under seal.

The application of photography would be of especial importance in the passport system. Here it would take the place of the entirely unreliable means of identification. A bust picture could be placed in the passport itself, thus rendering an intentional exchange or deception entirely impossible.

For instance, the application of photography would be of importance for those numberless rogues, gamblers, swindlers, and blacklegs generally, who, with names of rank, are so fond of visiting watering places.

In *Danzig* the police authorities have the portraits of all pickpockets collected, and the album thus composed is laid before each one guilty of this theft.

The writer finally recommends for the practice of photography, the appointment of a sworn photographer in connection with larger courts of justice and that, in smaller courts, either the clerk of record, or the secretary learn photography, and further, that a photographic apparatus and a travelling tent be obtained at the expense of Government.

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* "Archives of the Prussian Criminal Law." Edited by Dr. Coldamner, October number, 1864. See also report of the sitting of the Photographic Union, November 6th.

ON POSE AND LIGHTING.

BY MM. PETSCH AND H. VOGEL.*

In the two preceding articles we dilated upon the defects which too frequently deprive proofs, irreproachable in a technical point of view, of their artistic value: we now proceed to point out the means of avoiding these defects, and of producing proofs which art can accept without going beyond the limits within which photography is restricted.

Here many points are to be observed, and we shall see that to obtain claims to esteem and success, the photographic artist has no less need than the painter and sculptor of a profound study and of the faculty of observation. In the same manner that these latter, to produce a work full of life and beauty, must study the minutest details, the flow of the draperies, and the most evanescent expression. So the photographer is compelled to a study, no less minute of his original: he must dwell upon its *tournure* its clothing, and its *pose.* Nevertheless, the two arts—photography and painting, differ essentially: the aim of both is to represent on a *plane surface* the image of an object which is not flat; but a painter can always embellish, in an artistic point of view, an imperfect model: he completes it according to the suggestions of his fancy and imagination, can correct defects; in a word, *idealize.* But it is not the same with the photographer; he is debarred from making the slightest change in his pictures, except in some accessory details. All the beauties to be found in the copy must pre-exist in the original; his whole task is, therefore, limited to posing and lighting the model in the most advantageous manner, then to animate it; and then, but not till then, commence his mechanical operation of exposure.

But this is not saying, however, that it is sufficient to have good models in order to obtain good artistic proofs. Suppose the model to be imperfect; the photographer must know how to seize upon the least defective aspect, or, at least, apply himself to conceal its defects as much as possible. If this point be neglected, the most perfect apparatus, the purest chemicals, and the most approved formulæ, will never suffice to the production of a good proof.

We now proceed to examine in detail the elementary principles of the art. The first point which will engage our attention is *lighting.*

Lighting. Light is the vital element: it is the photographer's pencil.

An exact knowledge of the properties of light is as important to the photographer as a knowledge of pigments is to the painter.

Like the draughtsman and the painter, the photographer's aim is to produce on a plane surface a representation of objects, giving an impression of their being in relief. The figures must not appear flat like the paper which bears them, but modelled, with all their planes. Two means contribute to produce this illusion: the first is *perspective.*

All objects of the same dimensions appear smaller when at a distance from the eye than when they are near to it. Now, if the draughtsman, starting from this observation, takes care to proportion his figures in a true relation according to their distance from the spectator, he will succeed in producing the illusion of nearness or distance, although all the figures, being depicted on a flat surface, are really at the same distance from the eye. Pictures, in which this law had not been taken into consideration, like those of Cranach, Van Eyck, and others of the old masters, appear really flat. We at once comprehend how important perspective is to the draughtsman and painter.

The second means of giving a plastic appearance to the figures projected on a plane is *the proper distribution of light* and shade, or technically speaking—*chiaroscuro.*

We may ascertain the importance of this distribution of light and shade very clearly by drawing two rectangles side by side: they are both only simple plane surfaces. But when we shade one of them with indian ink, deepening gradually from one side to the other, this rectangle, without ceasing to be a plane, suddenly presents the appearance of a cylinder. On the other hand rounded objects sometimes appear as though they were flat, by deficiency of contrast of light and shade. We know very well that perspective in photography depends almost exclusively upon the instruments, and to obtain it it is sufficient that the position of the objective or the camera obscura be such that the feet, hands, &c., are not enlarged by the lenses. The artist has then only to occupy himself with what constitutes his capital resource, the distribution of light and shade, and it is in his power to obtain everything by it. Let us examine more closely what takes place, and first study the essential matter that produces the pictures, viz.,—light. This agent which nature furnishes us with for nothing, is so energetic in its action, that we do not know how to obtain half tone in the direct rays of the sun, or with unattenuated light. In portraits, for example, we should never have anything but faces flat white on one side and of a deep black on the other, without modelling or relief, harshly cut by shadows without transition or chiaroscuro. Reflections from screens and other reflectors do not give the best results, even when the light of the sun does not illuminate the model directly. Curtains even, only protect the model in a very insufficient manner: the light passing through them also destroys the chiaroscuro, and renders the image vague and indecisive. Consequently, we banish the direct rays of the sun, not only from the sitter or object, but also from the operating room, which must be lighted from the north, and moreover protected by a screen, allowing the operator to work in diffused light, whether the sky be clear or cloudy.

Although we may, in general, consider the rays of the sun as being parallel with each other, the rays emanating from the sky take, none the less, all manner of directions: those proceeding from the horizon are horizontal: those which come from the zenith are vertical. These facts are important to note. While a body lighted by the sun presents a clearly marked contrast of light and shade, by virtue of the parallelism of the luminous rays, in another body illumined all over by the light of the whole celestial vault, the lights and shades will be found mingled without opposition. In this particular circumstance, a salient body appears flat, as we may assure ourselves by regarding very elaborate architectural ornament in cloudy weather. And this explains the slight relief in portraits taken at such times.

If the sitter, in a photographic operating room, receives light all over, the picture will, necessarily, be without relief. From this it follows that to obtain good proofs, truly modelled the light must necessarily fall only on one side of the object.

To obtain this effect, we furnish our operating room with moveable curtains. This side light furnishes us with a suitable distribution of light and shade, but it does not follow that the dark side of the object must receive no light whatever; on the contrary, it must be moderately lighted by means of reflecting screens, which reduce the strength of the shadows, permitting the details to be seen, and establish an harmonious transition in the whole. We will show in what direction the mass of light must fall upon the sitter.

The several cases that present themselves may be reduced to the three following:—The light falls upon the model in front, *full face,* that is to say, starting from a point situated opposite the nose; *on one side,* that is to say, in a direction perpendicular to the preceding; *from above,* parallel to the length of the body. We thus distinguish, then, three kinds of lighting; that from opposite, or *full face*; that from one side, or *side-light*; and that from above, or *top-light.* If we suppose for a moment that a narrow window at the side of a sitter in a glass room, furnished with curtains, is opened, the forehead *perpendicular* to the glass, the model will evidently be lighted on one side; then, if he afterwards turn himself towards the glass, and place chest and forehead parallel to the latter, the lighting will immediately become full face.

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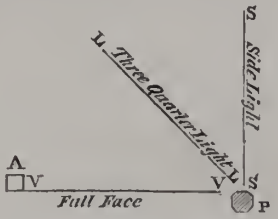
* Continued from page 55.

We perceive, by this operation, that the denomination of the lighting will vary with the position of the sitter, and that to avoid all misunderstanding on this subject, we must fix the meaning of these denominations differently from what they have been understood hitherto. Suppose, then, that the paper upon which we now draw the figure which



will serve for our demonstration, be the floor of the operating room; the square A the camera; P the sitter, seated square to it; we name the light which strikes the sitter in the direction V V (the line which unites the sitter and the camera), the *lighting in full face;* the horizontal ray S S perpendicular to this line, *side lighting*; and the vertical ray falling upon the sitter, *lighting from above.*

But independently of these three principal directions, light may affect many other intermediate ones, for example, that which we call *three-quarter light*, L L, that which falls from above diagonally, &c. We now proceed to observe and describe the effect of these three kinds of lighting, *full face, side light*, and *top light*. We add to this demonstration three portraits,* intended to elucidate it, and which furnish a specimen of each kind of lighting. By this means we can demonstrate the powerful influence that lighting exercises upon the relief and tone of the picture, upon the likeness and general character of the physiognomy.

Fig. 1 represents a portrait lighted full face, taken with an objective embracing a field of 2½ square yards, at a distance of 5½ yards.†

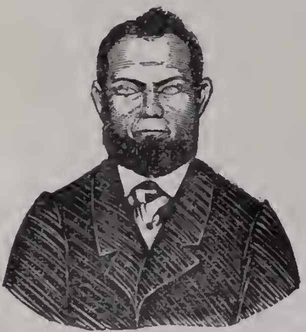


Fig. 1.

Fig. 2 is a portrait lighted on one side, taken with an optical field of 5½ feet square, distance 8 feet 9 inches.

Fig. 3 is a portrait lighted from above, taken in a field of 5 feet by 6 feet, at a distance of 6 feet 8 inches.

We think it necessary to remark that these are three portraits of the same person, taken at one sitting, in the same position, in the same proportions, nothing being changed in fact, except the lighting.

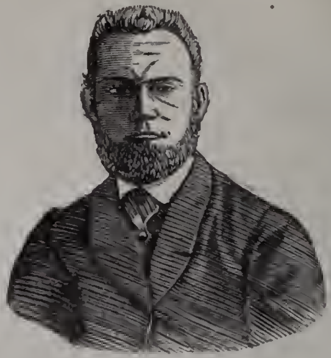


Fig. 2.

We believe it to be useful to make this remark on account of the great dissimilarity between the three portraits, a dissimilarity caused only by the lighting, and which is such that most of those who have seen this portrait under these three aspects have doubted whether they were from one and the same original.

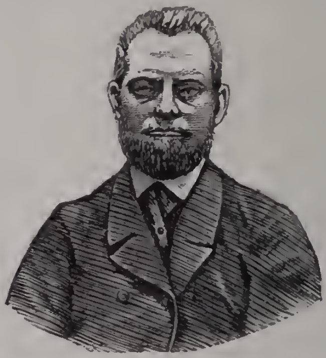


Fig. 3.

We will now consider the influence of the different lightings upon the model.

In fig. 3 the eyebrows form a hard projection, the nose casts a very black shadow, the prominent cheek bones cause the cheeks to appear hollow, the mouth is hard and exaggerated, and the beard projects like a cushion.

In fig. 2 the beard is lighted, the cheeks under the cheekbones are flaccid and deficient in roundness, while the eyes appear almost flat in the head.

On the contrary, the forehead, cheek-bones, and under the nose show lines which disappear entirely in fig. 3. On the other hand, in fig. 2, the lines under the eyes and nostrils are much more strongly marked than in fig. 3. From the hard manner in which the shadows cut the lights, the whole of fig. 2 has the effect of a cube, a corner of which is turned towards the eye of the spectator. It is the medium line of the visage which dominates over all the others, and imparts to the physiognomy the aspect of a goat.

Fig. 1, on the contrary, is like a cube with one of its sides facing us; the eyebrows are scarcely to be made out. There are no traces of the characteristic lines we have described as existing above and below the nose, in the preceding figures; the beard and clothing are almost as flat as the face. The lines of the nose extend beyond the eyes, and are prolonged beyond them in two symmetrical curves. The mouth is small in comparison with that in fig. 3. The whole has the aspect of a flat board upon which the outlines of a face have been drawn.

From the comparison of these three portraits, it follows that the lighting completely changes the lines and depression of a face, by suppressing or increasing them. If we also take into account the action of the lighting upon the colour of the different parts, we shall be immediately struck with the difference between the hair and the beard. While in *figs.* 2 and 3, it appears to be grey, in *fig.* 1, it appears to be black; in *fig.* 3, and in the lighted part of *fig.* 4, every hair may be distinguished. In *fig.* 1, on the contrary, the hair and the beard form a compact mass deprived of detail.

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* The illustrations in the *Mittheilhungen* were photographs, copies of which Dr. Vogel kindly offered to furnish for us; but the impossibility of meeting the demands of our circulation by printing several thousands from a negative in a reasonable time was a sufficient reason for adopting wood engravings, in which we have endeavoured to reproduce accurately the characteristics of lighting in the photographs. Our engraver has been more successful in his literal rendering of the photographs than in producing pleasing pictures.—Ed.

† The model was seated against the south wall of the operating room, the face turned to the window on the north, where the camera was placed.

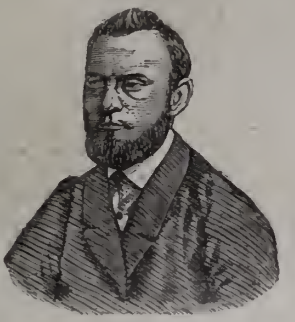

Fig. 4.

The cause of this want of detail is also due to the lighting, as the illumined side of the hair shows to us. In the lighting of this side, the light and shade of every hair are quite distinct, and the entire head of hair is modified in its aspect. If it appears much blacker in *fig.* 1, it was because the model in this position was much further from the light than in the other two; the clothing is darker for the same reason. On the other hand, the back ground is lighter than in the proofs Nos. 2 and 3; this is because it receives more light than the model: besides, the shadows of the latter are almost entirely concealed by itself, while in *figs.* 2 and 3 the back ground, situated several feet from the objective, receives only a part of the light, which falls directly on the sitter vertically, or on one side. We must also remark on the light colour of the coat in *fig.* 1 (that of the sitter was black): this is an effect of the chemical action of the vertical light, an action carried here to its maximum of intensity; by a natural consequence, the hair and the forehead experience the same action, and their excessive lightness causes the shades to appear blacker. We see by this also that the lighting greatly modifies the colour of the hair, clothes, and background. We now arrive at the influence of the lighting upon the expression, and here the most superficial observer will agree with us that, believing that a very sharp, carefully manipulated proof must always be a good likeness, is to fall into a palpable error.

Fig. 3 gives us the eyes dark and scowling, and this repulsive air is also increased by the strongly projected nose, the strongly compressed corners of the mouth, and the prominent cheekbones standing out in violent contrast from the dark parts of the cheeks. See, on the other hand, the vacant and dull expression of *fig.* 1, and the pale soulless eyes, like those of a dead cod-fish. The lines of the features, which impart to them character and energy, are completely obliterated. *Fig.* 2 occupies a medium between the other two; it is not so stupid as No. 1, nor so fierce as No. 3; but the contrast of light and shade gives to this portrait, with its wrinkled brow, a too excited expression: but the shaded side of the face has too menacing an expression for the lighted portion. The physiognomy is more characteristic than the others, but it is not the portrait of the individual, as he really appears. it is too angular. Here, again, we can prove the importance of the lighting, and how much it may cause the expression of the face to vary. It may brighten a gloomy countenance, and soften it; and on the other hand, deprive a strongly marked physiognomy of all its expression.

The reader will naturally enquire—which of these portraits presents the true expression of the model.

Not one of them. But to give an idea of the manner in which the three lightings we have adopted modify the physiognomy of a person, we add (fig 4) the true portrait of the model, which all his acquaintance at once recognized.

The kind of lighting we have adopted to produce this proof will form the subject of our next communication.—*Photographische Mittheilungen.*

(To be continued.)

ON THE EXTRACTION OF PURE SILVER FROM RESIDUES.

BY DR. D. VAN MONCKHOVEN.

1st. *From Old Baths of Nitrate of Silver.*—Filter them, add ammonia until the brown precipitate first formed is redissolved, then add *sulphite of ammonia*, or, preferably, pass a current of sulphurous acid gas into the liquid. Upon heating the liquid to about 100° Fah., at the end of an hour all the silver is precipitated in an *absolutely pure state.* I believe I am correct in attributing this method to my illustrious fellow-countryman Stas.

The pure pulverulent silver thus obtained is washed and directly dissolved in nitric acid to form nitrate of silver.

2nd. *From Washing Waters.*—Washing waters, especially those derived from washing paper positives before toning, are collected in a cask in which a large sheet of copper is placed; at the end of four-and-twenty hours all the silver is precipitated. When the contents of the cask have been frequently renewed, the grey powder of metallic silver is collected and dissolved in nitric acid, ammonia is added, and the liquid filtered. The sulphite of ammonia formed precipitates pure silver.

3rd. *From Paper Clippings, &c.*—The pieces are burned one by one, so as to convert them into white ashes, which are weighed. They are treated with their weight of nitric acid mixed with twice its volume of water, and heated to 212° Fah. The silver is all dissolved. Filter, wash the residue, filter again, and pour the silver solution into the cask in which the sheet of copper named above is placed.

4th. *Old Hyposulphites* are treated by the ordinary method; they cannot be treated by this one.

5th. *Chloride of Silver.*—When we possess chloride of silver, we dissolve it in ammonia, filter, and add *sulphite of ammonia.* The silver is deposited in a pure state.

The method with sulphite of ammonia is very convenient, and yields chemically pure silver. Every salt of silver dissolved in ammonia, and to the solution of which we add sulphite of ammonia, is reduced to the state of pure silver, and this is effected in warm solutions (100° F.) in the course of half an hour. If cold, it takes 24 hours, but then the precipitation is more complete.—*Le Moniteur de la Photographie.*

APPLICATION OF PHOTOGRAPHY TO OIL PAINTING UPON CANVAS.

M. DE RUMINI'S PROCESS.

The object of M. de Rumini's invention is the reproduction by means of photography, upon canvas prepared for oil painting, *primed canvas*, of portraits, landscapes, monuments, still life, and with increase or diminution in size of the object represented, and of which the special aim is to enable oil painters to avoid drawing the subject by hand upon the canvas.

Preparation for Carbon Printing.—Cover the canvas with a liquid composed of—

Bichromate of potassa	15 parts
Gelatine	20 „
Distilled water	100 „

The mixture of these ingredients is made warm in a *bain marie*: it is applied while warm to the surface of the canvas, and spread evenly with a glass rod, and then left to dry.

Preparation of Albumenized Collodion Canvas.—The canvas is first covered with a coating of photographic collodion, in the same manner as glass plates are covered. When the alcohol and ether contained in the collodion are partly evaporated, the coating of collodion is covered with a film of bromo-iodized albumen, prepared as follows:—

Albumen	100 parts
Water	100 ,,
Iodide of potassium	2 ,,
Bromide of potassium	1 part.

The only object of employing the collodion is to cause the albumen to spread evenly upon the canvas. Its state of humidity permits this result.

The collodion film being dry, there would be the same difficulty in spreading the albumen upon it as there would be upon the oily surface of the canvas.

The coating of albumen being completely dry it is sensitized and coagulated with a solution, applied by means of a tuft of cotton, composed of

Distilled water	100 parts
Nitrate of silver	10 ,,
Acetic acid	100 ,,

The albumen is next submitted to a washing with water, to remove the excess of nitrate. The canvas, when completely dry, is exposed behind the solar microscope to the action of the negative to be copied, until the picture appears faintly upon it. This latter is developed by means of a saturated solution of gallic acid, the action of which is stopped by means of a washing with water. The picture is then fixed with a saturated solution of hyposulphite of soda. The operation is concluded by washing with water.—*Le Genie Industriel.*

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ON THE USE OF CHROMATE OF POTASH AND AMMONIA IN PHOTOGRAPHY.

BY M. CAREY LEA.[*]

I have been engaged in making some experiments on the use of the double chromate of potash and ammonia in photography, especially in connection with carbon printing. As I perceive that M. Emile Kopp has lately been working in the same direction, and has published his results, I shall discontinue the examination, and merely make a few remarks on the subject.

I was lead to believe that the double chromate might prove very valuable in photography, from the following theoretical considerations:—When two equivalents of acid are combined with one of base, the second equivalent is always more loosely combined than the first, and a comparatively feeble attraction from other bodies is sufficient to detach it. Consequently, when gum or gelatine is mixed with bichromate of potash, the second atom of chromic acid is so easily detached from the potash, that in the course of a short time, sometimes even in a few hours, the organic matter is oxidized and rendered insoluble. If we endeavour to avoid this difficulty, and form a mixture which keeps better, by substituting the neutral chromate, we encounter the difficulty that our mixture is thereby rendered too insensitive. It first occurred to me to use the neutral chromate of ammonia, which ought to be much more sensitive than the neutral chromate of potash, because of the much less stable character of the base. But the double salt of potash and ammonia seemed to offer still greater advantages,—as very much easier to prepare, more permanent, and likely to have all the advantages of the chromate of ammonia.

The experiments which I have made fully confirm this supposition. The double salt is quite sensitive enough, and possesses excellent keeping properties when mixed with organic matter. For example:—Last winter, in working some of the old carbon processes, I found that mixtures of gum and bichromate of potash with carbon, when spread on paper, could not be reckoned on for more than a few hours. I have even seen paper, prepared and dried late at night, become insoluble and worthless by next morning, although thoroughly protected from light, and found that the only certain method was to prepare the paper early in the morning, and use it the same day.

On the other hand, I have this morning tried some paper prepared twenty-three days since with the chromate of potash and ammonia, and which is still in excellent order. How much longer it would retain its good properties I am unable to say; probably for a very considerable time.

It is by no means necessary to crystallize the salt, as directed by Mr. Kopp. This is an unnecessary trouble, and besides, when kept long, the crystallized salt loses ammonia, and gradually is reconverted into bichromate of potash. Nor is it necessary to expel the excess of ammonia by heat, as directed by him. It answers perfectly well to take a cold saturated solution of bichromate of potash, and add liquid ammonia until red litmus paper becomes faintly bluish. The inexperienced operator may test his work, by assuring himself that the addition of a few more drops of bichromate solution destroys the property of rendering red litmus paper blue, and then restoring it by a few drops more ammonia. A slight excess of ammonia is in no way prejudicial.

M. Kopp thinks that paper simply imbued with the solution of the double salt will be useful for copying negatives and old engravings. I do not think this will be the case. The depth of tone which can be obtained is not sufficient.

It is also proposed, in the article just referred to, to produce various tones by plunging these bichromate prints into various dye-infusions, whereby the dyestuffs are fastened on the sunned parts, and not on the others.

The editors of the *Phot. Mittheilungen* (in which the article in question just reached me yesterday), in translating the article claim the above discovery for M. Grüne. But it has long been known. I have now before me prints which I made in this way more than a year ago. Nor did it originate with me, but was first published by an Italian photographer, M. Sella.[*] The effects which are obtained are interesting, but will never displace silver or carbon. The best results which I obtained were got as follows:—

Make a solution of the chromic salt intended to be used, in the proportion of 30-grains to the ounce of water, and dissolve in this an equal quantity of good gelatine. Float the paper on it, avoiding bubbles, which requires great care, and hang up to dry. Expose, one to two or three minutes; wash first, and dip in the dye-bath afterwards. Infusion of extract of logwood answered better than anything else that I tried, and gave a purple black, much resembling the colour of a silver print. As the whites were not clear, I threw the prints into a very weak solution of so-called "chloride of soda," watching them carefully, and then washing thoroughly.

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EXPRESSION.

BY REV. A. A. E. TAYLOR.[†]

"It is not *the features* you know, but the *expression*." Particularly is this soberly true in photography. The painter may touch tenderly the tender points of a subject's face. An ambitious nose, an unruly cheek-bone, a mouth that was rudely slit instead of being cut with the stamp of Cupid's bow, or any other feature that aspires to disagreeable shape or proportion, may be gently modelled beneath the painter's pencil into a thing of beauty, without offending in the least the feelings of the sensitive sitter. But the lens has this disadvantage, that it is prone to tell the truth, even though its subject be a prince. The resort of the photographer must, therefore, be to remedy by the expression what is ruined by the feature.

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[*] From the *Philadelphia Photographer.*

[*] Since the above was sent to the printer, I see that this old process has just been *rediscovered* and patented in England. Even the same substance, logwood, is proposed as the dye.

[†] From the *Philadelphia Photographer.*

To be sure, a critical artist will so exert his studied taste as to arrange in agreeable and appropriate postures his subjects, so that their defects or deformities will, by reason of the true position, be rendered the least prominent and disagreeable in the picture; and this is a study to be recommended to every practitioner of the art.

But, after all, the securing of a true and pleasant *expression* should be the highest aim. The difficulties to be encountered here are innumerable, and in many cases absolutely insurmountable. The first and greatest is found in the variety of people who throng to his gallery. Some people have naturally a very bad expression; not unfrequently it is positively hideous, and, if transformed to the card, would frighten the ogres themselves. Others have very mild and soft expressions, that would not leave themselves distinctly stamped even upon the paper; while we regret to be obliged to affirm that the number of those is by no means small who have no expression at all, no more than the back of a spoon or a bowl of milk, including the mush. These people all have to be wrought into pictures which have a pleasant and attractive expression, or the picture will not suit. They are as clay in the hands of the potter, and all require to be made into vessels of honour and comeliness. Another difficulty readily observed is this,—that when the public comes to sit for its picture, it either resolutely distorts its features into unaccustomed and absurd expression; or, resigning itself to a position of perfect aquiescence in the will of the operator, determinately banishes whatever expression it had to start with. Is it possible for people to take their seats before the camera without assuming some expression that is unusual, inappropriate, or entirely original? All want to put on their prettiest; and so they either set their lips, or enlarge their eyes, or widen their mouth, or affect the expression of meekness, or benevolence, or heroism, as it may be; which affectation, if transferred to canvas as they desire, would make them look like a gallery of Bridewell patients.

Now, the skill of the artist is to find its exercise in the remedy for all these various conditions; and his taste in the evocation of expression will be called into great and constant demand. The subjects, alas! cannot see how they themselves appear. They think they are doing the fine thing, just when they are making themselves appear most ridiculous. The operator must manage them to his own taste, and must do it without offending their vanity, or treading upon their peculiarities, of which we all have a good share. How to do all this is, of course, a problem, and one as diversified as the persons who present themselves before him. He has to render into respectable appearance all the variety of human character itself, and he cannot be expected to succeed in this without careful and perpetual reflection. Every sitter is, therefor, a new and independent study.

The mouth is easily arranged into respectable expression. The nasal organ expresses itself in spite of everything; and so does the cheek. The brow is dependent upon the eye, and the eye is the most refractory and defiant of all. When one sits down to look quietly at nothing, the expression of the eye naturally subsides into blank vacancy. There is a sort of excitement in sitting for a picture like that of having a tooth drawn, though without the dread of pain. The heart is generally making better time than usual; and the eye, sympathizing, will often remain entirely expressionless, or will fortify itself with a frown. This condition of affairs is aggravated by the necessity of a bright light from above, which taxes its strength, and by the fixed gaze maintained for several moments upon one point, not generally very distinct. The result is apt to be a poor picture, because the eyes are unnatural or meaningless.

Two suggestions may be made as to the remedy. First, the eye should be accommodated with pleasant surroundings. It should rest upon an object which both in *shape* and *colour* is perfectly agreeable to it. The writer remembers to have sat in a gallery where his eye was fixed upon a small dark point, behind which was a wall, the paper whereof was of white ground, with a small blue figure upon it. The result was, that in a moment that whole wall was a whirling maze of figures which dazzled his eyes, and, of course, destroyed the naturalness of the expression, as it deprived the eye of its strength. In another gallery the glare, through a side window, of a large white building, not far off, in the reflection of the strong sunlight from it, produced essentially the same effect. The object towards which the eye is directed should not be painful, but one which will give rise to a pleasant *feeling*, as this alone will give a pleasant effect upon the face. A beautiful picture, producing emotions of a cheerful and admiring nature, would greatly assist the operator in gaining satisfactory expression.

The remaining suggestion is near akin to the former. The attention of the subject should be, if possible, directed away from the thought that he is sitting for his picture. This will give the desired *naturalness*, relieving the picture of that formality, and restraint, and stiffness which deadens it, and gives it awkwardness. This end might be attained in various ways, one of which the writer will venture to suggest for experiment. After the subject is seated in position and ready, let some agreeable person come before him at the point to which his eyes are directed, and, after bidding him remain perfectly quiet, engage in conversation upon some topic which will induce the expression of interest, engaging the attention, and of course, absorbing the conversation entirely. During this narration the artist may quietly complete his work. A person, apt in detecting human characteristics, will soon learn what subjects of talk to introduce in every case, adapted to the character of the sitter, and drawing the natural expression of interest to his countenance. A fair-featured woman with the gift of graceful conversation would readily learn her part, and achieve admirable results of expression in the picture. Or, in each case, it might be a person of opposite sex to the sitter. But if the attention of the subject be not engaged on some other thought than that his features are being transferred to print, the true end of a likeness cannot be attained, or the highest perfection of the art reached. Otherwise the picture will be moody, expressionless, or that of somebody else. These suggestions and illustrations are made modestly, for the reflection of those most deeply interested,—both the artist and the public,—and for the relief of some of the most serious difficulties in the practical operation of the art. They may suggest better remedies to others, and call forth brighter thought than any the writer can aspire to present. Give us, gentlemen, *expression*, and we will be content. For, after all, upon this in great mesure depends the truth and accuracy of our card representatives. When you succeed in overcoming the obstacles we innocently throw in your way, you will be entitled to, and will receive, universal acclaim from men, women, and children, from all classes and conditions, from the country, and from the town.

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Indian Portraits.—A volume of photographic portraits reproduced on steel, with memoirs of all the celebrated native personages of the three presidencies of Bengal, Bombay, and Madras during the last century, is on the eve of publication at Bombay, under the patronage of the new race of native gentry.

ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

Process for Enlarging and Diminishing Engravings.—Mr. Collins' process for enlarging and diminishing drawings or engravings was chiefly mechanical and lithographic. The plan was as follows:—A print from an engraved plate, wood block, or lithograph, was taken in the ordinary manner, but in transfer ink, and upon a sheet of vulcanized india-rubber, covered with a composition of equal elasticity, and of a non-porous character. If it were desired to enlarge the design, the india-rubber upon which the impression had been taken was attached to a frame by means of hooks passing through holes made at equal distances round the edges of the india-rubber. Four bars were then passed through the body of the hooks, and the sheet was thus prepared for the extending machine, which consisted of two parts, viz., a table and screws, the latter being used to stretch the rubber equally to the required dimensions. The impression was then transferred and printed by the ordinary litho or zincographic processes. If the design was to be reduced, the india-rubber was stretched before the impression was taken upon it, and afterwards allowed to contract to the required dimensions in the regulating machine. Mr. Collins considered that his process would afford a ready means of adapting a design, when once made, to the size and character of the same work when printed in editions of various size of page. Mr. Collins, however, found the lithographic process of printing a great impediment in the way of his progress, and attempted to obtain a surface block by building up the impression transferred to the stone, by depositing a succession of layers of printing ink mixed with suitable dryers, and when such building up of the ink had been carried sufficiently far, a cast in wax or other material was taken, and from the cast so obtained a copper block was secured by electro-deposition. This process was tedious and uncertain in its results, and like its predecessors, failed to secure the object aimed at.

I cannot help expressing an opinion that one great source of failure in the majority of the plans proposed has been, that the authors of them have been too ambitious in the selection of subjects, or almost entirely ignorant of the art of engraving. They have endeavoured to arrive at perfection at once, and have consequently failed. The subjects selected have in many cases been crowded in composition and too full of detail, and the result has been a deficiency of definition, a want of force, and an entire absence of artistic effect, due to the want of gradation in the lights and shadows. Several of the plans which have been proposed are probably capable of yielding good results, if the attempt to apply them is confined in the first instance to sketches in outline, a class of art but little practised, but one which is capable of affording the highest gratification and of employing the most skilled artists. By beginning with art in outline, experience in manipulation would be gradually acquired, and a chiaroscuro effect ultimately attained to if desired; and I have little doubt that blocks in outline can be readily produced, either by the electro-magnetic or mechanical process of Mr. Hansen, or the more recently-discovered processes of Messrs. Vial and Dulos.

Electro-Magnetic Engraving.—The process of Mr. George Hansen is as follows:—The drawing which it is desired to engrave is made on a metallic or conducting surface, with a resin ink, or some other non-conducting substance. As soon as the ink is dry or hardened, the plate with the drawing is placed on the moveable table or bed of a machine, side by side with a plate to be engraved. The machine is constructed somewhat on the principle of the planing-machine. A pointer or feeler is so connected by means of a horizontal bar with a graver, that when the bar is moved, the drawing to be copied passes under the feeler, and the plate to be engraved passes in a corresponding manner under the graver. The plate is engraved by placing the graver under the control of two electro-magnets, acting alternately — the one to draw the graver from the plate, the other to press it down upon it. The drawing being made on a conducting surface, an electric current is established, so that when the feeler or tracer which passes over the plate, with the drawing upon it rests on the metallic surface, it passes through the coils of the magnet, and causes it to lift the graver from the plate, but when it reaches the non-conducting ink of the drawing, the current of electricity is broken, and the magnet ceases to act, and, by a self-acting mechanical arrangement, the current is at the same time directed through the coils of the magnet, which then acts powerfully, and presses the graver down into the plate. This operation is repeated again and again, till the entire surface has been cut away to a uniform depth by the graver, by passing it in parallel lines over the entire surface of the drawing. From the plate so engraved a type metal cast is taken, which being a reverse, in all respects, of the engraved plate, is at once fitted for use as a block for surface printing.

To be continued.

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Correspondence.

GELATINE DRY PROCESS—REDUCING CHLORIDE OF SILVER.

Sir,—Having tried the gelatine dry process for some time, and never having been able to get the solution quite clear, I have adopted the following plan, viz.: When the gelatine is placed to soak in the water, add acetic acid in the proportion of one minim for each grain of gelatine, when the latter is sufficiently swelled, dissolve by heat and filter. The solution is now perfectly clear. I now add sufficient carbonate of soda (or a saturated solution in distilled water) until a piece of litmus paper previously put in the gelatine, has the blue colour restored. Now warm and coat the plates, drain, and put away to dry in the dark. When perfectly dry, I have washed the plates for two or three minutes with a saturated solution of gallic acid, using distilled water, and filtering before applying to the plate. Wash under a tap, and put the plate away to drain and dry. Expose and develop as usual.

I enclose a print from a negative, prepared in this way. It is unfortunately a little speckly, but this is owing to dust, as I had unfortunately to work in a dusty room. Exposure 3 minutes, time 10 a.m. (a bright light) single lens ½-stop. It may seem at first sight that it was unnecessary to render the gelatine alkaline, when an acid is afterwards applied to the plate, but I considered that had I not done so, the plates would have been too acid. I am inclined to think that a cleaner and better negative can be obtained if the gelatine is cleared of all insoluble filaments, than would be the case if this precaution were not attended to. Should any of your readers feel inclined to try this plan, I should be very glad if they would kindly communicate their experience. I should perhaps add that I always varnish round the edges of the plates, when they are dry; using a strong shellac varnish for this purpose, and that I find this is quite sufficient to retain the films. I exposed some dry plates a short time ago, prepared according to Mr. Bartholomew's process, and am inclined to think that they lose in sensitiveness by long keeping. The plates referred to had been prepared for months or more. The exposure, single lens, was seven minutes, and on developing, did not appear over-exposed. The light however, was not so good as it has been latterly, and owing to the high wind, the camera vibrated considerably, of course producing a blurred image.

While I am writing, I may perhaps as well mention a simple plan I have adopted for reducing chloride of silver to the metallic state; or I should rather say; extracting metallic silver from the chloride, which is—

Wash well in two or three waters the chloride, which is then dried by heat in a sand bath, powdered and dried in a crucible with wood charcoal and chalk finely powdered.

Chloride of Silver	...	1 part by bulk.
Chalk	...	1 „ „
Charcoal...	...	2 or 3 „ „

Place the mixture in a crucible previously heated; and stir occasionally with an iron rod, when (the fire having been kept at a white heat) the reduced silver will be found in small buttons upon pouring out the contents. Apologising for taking up so much of your time.—I am Sir, your obedient servant. T,

[The print enclosed is very satisfactory.—Ed.]

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* Continued from p. 104.

COLLODIO-CHLORIDE OF SILVER.

Sir,—As the collodio-chloride process seems likely to engage attention, I venture to make known a means of dissolving nitrate of silver in collodion, which is, I think, more simple than any hitherto suggested. It is as follows:—Take a weighed quantity of soluble cotton, dip it in a saturated solution of nitrate of silver, squeeze, dry it, again weigh it, and note the increase in weight. On dissolving this cotton in alcohol and ether, the silver salt well dissolve at the same time.

While writing on this subject, I will just mention a very old experiment of mine, which may, perhaps, be worth trying in connection with it. I took plain salted paper, and sensitized it with carbonate of silver dissolved in a saturated solution of carbonate of ammonia. Paper so prepared was very much more sensitive to light than the ordinary paper, and the prints were more vigorous; but as it did not admit of the use of albumenized paper, the process was laid aside.

Carbonate of silver may, I think, be suspended in collodion in the same way as the chloride, and as, in my experiments, it proved a much better sensitizer than the nitrate, the experiment may be worth trying.

April 3rd, 1865. C. Springham.

THE PANTASCOPIC CAMERA.

Sir,—Will you permit me to trespass again upon your valuable space to offer some remarks upon the letter of "Architecton" in the News of March 17th.

His diagrams are so obviously exaggerated that I did not intend to reply to his letter until urged to do so by several friends.

Mr. Le Neve Foster has remarked upon "Architecton's" erroneous statement as to the personality of our controversy. I will, therefore, pass at once to his diagrams. No. 1 is a very elaborate contradiction of that which I have never asserted, viz., that the projection of the pantascopic views is upon the flat or plane surface. I say that the picture is taken upon a flat plate, and, therefore, that the manipulations in taking the negative, and in printing the view, are those of ordinary photography; but I have also distinctly stated that the relative motions of the plate and lens are such that the surface on which the picture is received is that of a cylinder, or more correctly, it is that of a polygonal prism having an infinite number of sides (see Photo. News March 3rd).

There was no occasion, therefore, for "Architecton's" intervention to adjust the relations of the vendor and intending purchasers of the pantascopic camera, so far as the assertions of the former had affected them. The views taken with that instrument have always been stated to be in panoramic, that is, in cylindrical perspective. It is asserted of them, that when viewed flat they almost invariably form most pleasing pictures; that for an immense range of subjects the discrepancy between the cylindrical and the flat picture is barely appreciable; that frequently the "distortion" is more pleasing to the artist-eye than the truth; but that when absolute truth is required, the view must be curved; and as the cards, upon which (as "Architecton" complains), the views are mounted, are of a flexible material, truth is at any time attainable.

While defining a scientific invention, and avowedly regulating the value of a commercial article, it is, I think, to be regretted that your correspondent allowed his illustration to be an extreme one. Exaggeration is certainly out of place in a scientific definition, and should, I think, have been avoided in the somewhat delicate position which he assumes between vendors and intending purchasers.

As the cameras are made for 120° only, it might have been desirable, while giving actual figures, to limit the consideration to that angle, instead of taking 180°. The relative length of base in the latter case is stated to be as 12 : 20, this is an exaggeration, but let it pass; in the former it is less than 12 : 15. In the first case, the excess of base line is (according to "Architecton") 66 per cent.; in the latter, 22 per cent., or one-third the former only.

Is it possible that "Architecton" had the interests of the vendor and intending purchaser before him when he was guilty of this exaggeration?

An extreme case is sometimes taken to prove a rule, and I should not have complained of this exaggeration, however out of place in a scientific discussion, or an impartial decision, had "Architecton's" third diagram not been what I must be permitted to call a gross distortion of this extreme case. Even if the views were 180° instead of 120°, no such discrepancy as that pretended between 2 and 3 could exist. No. 2 purports to be a representation of No. 3 when curved in the form of a semicircle. The most casual observer, must see that this is not so, and will not fail to recognize the untruthful character of these illustrations.

With this exaggeration of an admittedly extreme case before me, I must doubt "that justice to all parties" was the motive which prompted "Architecton" to engrave and publish these drawings. Neither truth nor justice is promoted by such a treatment of the subject. Had he given us his real name, I cannot but think that a less "extreme" and more candid mode of discussion would have been adopted. He would have avoided the erroneous remarks upon Mr. L. N. Foster and myself; he would have either spared us the preamble as to his motives, or he would have given us more truthful statements and illustrations; he would have been more careful as to his facts, figures, and definitions; he would not, for instance, have pretended that the statement of the picture being on a flat plate of glass meant that that picture is in plane perspective, while my assertion of the direct contrary was before him; he would not have given us the figures relating to an angle of 180° as those of 120°; he would not have exaggerated these figures more than 14 per cent.; he would not have grossly distorted his drawings of this exaggerated exaggeration; he would not have confounded a polygon with a polygonal prism, nor omitted to state that the "polygon" had an infinite number of sides, which render it vertically a cylinder.—I am, sir, yours, &c., J. R. Johnson.

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Talk in the Studio.

A New Opening for Photography.—Not long ago there appeared in various publications the copy of an epitaph on a tombstone, below which the widow had caused the announcement to be engraved, that she continued to carry on her husband's business; thus preserving a certain bond of union between the dead and the living, and making a profit out of the grave. Not long ago, it occurred to a photographer that he might increase his business by announcing that he copied photographs of deceased individuals, and prepared in such a way that, if placed in coffins along with the defunct, they would endure for any number of ages. Since that time the practice is said to have become common on the Continent; and it is very evident that a good deal may be said in its favour; more than can be said of a novel proceeding of a well-favoured widow, who, lately in one of the foreign cemetries, instead of hanging a crown of immortelles on the tomb of her deceased husband, hung a portrait of herself.—*Once a Week.*

A Murderer and his Photograph—An American paper has the following paragraph:—D. L. Bivins, who, it will be remembered, some time ago murdered his father, mother, and wife at Woodstock, Michigan, takes exception to the sale of photographs of himself by a business man at Hudson, because, as he alleges, they were taken over a year ago, with his uniform on, and do not resemble him now. He publishes a card, as follows:—"Adrian, Michigan, Feb. 28, 1865.—Editor *Cleveland Plaindealer*,—Please announce in your paper that the photographs taken and being sold by D. H. Spencer, Hudson, Michigan, are not genuine ones, as they were taken with my uniform on, and do not resemble me now; but there will be some immediately before the public that are genuine ones, and taken with my clothes on at the time the deed was done, and such as wish to purchase will do well to wait and obtain the genuine.—D. L. Bivins." The Detroit *Tribune* says he is in the habit of circulating among the crowds who visit his cell, cards containing the name, as follows:—"D. L. Bivins, the Murderer."

Exhibitions of Arts and Manufactures for North Eastern London.—An industrial exhibition to be opened in August next, in the Agricultural Hall, Islington, is announced. "Photography and Photographic Apparatus" are to be exhibited in Section III., with the philosophical instruments, and processes dependent on their use, &c. The photographic department will be under the management of the North London Photographic Association.

Cheltenham Amateur Photographic Association.—Many of the photographers residing in Cheltenham and the neighbourhood have formed themselves into an Amateur Association, similar to that of London. One of their rules, and we think it an excellent one, is, that any member who does not produce a certain number of good negatives in the year will be fined. The office bearers are Dr. Abercrombie, President; Mr. Baynham Jones, Treasurer; Dr. Wilson, Hon. Secretary. Honorary members are admitted at an increased subscription.

The Marseilles Competition for Enlargements.—We have received from M. Vidal, just before going to press, the report of the adjudicators in the Marseilles Competition for Enlargements. Dr. Van Monckhoven carries off the gold medal for enlarged portraits and the silver medal for enlarged views. Details in our next.

The Art Student.—We are glad to observe a great improvement in the *Art Student*, especially in paper, printing, &c. The Editor appeals to subscribers to use effort to increase its circulation, which we hope will meet with satisfactory response. It appears that a rumour of its discontinuance has been circulated in some quarters; it is needless to add, after what we have said, that it is alive and looking well.

Royal Diamond Cameos.—On Saturday last the Princess of Wales honoured Messrs. Window and Bridge by sitting to them for her Diamond Cameo portrait. A charming picture was also secured of the infant Prince Victor Albert and the Princess.

Photography at a Banquet.—At the conclusion of the ceremony of opening the main drainage works, a few days ago, by the Prince of Wales, an operator from Messrs. Nigretti and Zambra was engaged for nearly an hour taking instantaneous photographs of the banquet scene.

Photographs on Ivory.—We recently visited the gallery of the United Association of Photography to examine some specimens. In addition to many exceedingly fine pictures on paper, by the Wothlytype process, we saw some very charming photographs on ivory, plain and coloured, produced by means of the uranized collodion, as we recently suggested and described. It is our conviction that this is the best method of photographing on ivory which has yet been adopted.

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To Correspondents.

Scarlet Negatives.—In reference to the article on this subject which appeared in our pages a few weeks ago, the *British Journal* says, "Mr. Carey Lea's new method of intensifying negatives by rendering them of a scarlet colour, appeared in this journal on February 3rd. It has reappeared in this country, copied from an American journal, in the pages of a contemporary, and has been credited to t. e transatlantic publication, instead of to the original source. We express no opinion on the fair dealing" &c., &c. Our American contemporary is here charged, by implication, with appropriation, and ourselves with endorsing such appropriation. Now, the facts are these: the article which appeared in our pages and that which appeared in the *British Journal* are two distinct articles, having nothing in common but the same subject; there is not, so far as we know, a single sentence alike in the two articles! But this is not all: the article in the *American Journal of Photography* (which we reproduced with due acknowledgment) is dated "Philadelphia, January 2nd, 1865," that, on the same subject, in the *British Journal* is dated "Philadelphia, January 13th, 1865;" we leave our readers to judge which of these is the "original source," that dated the 2nd, or that of eleven days later. The truth is, the same gentleman, very properly, contributed two distinct articles on the same subject to two journals, published many thousands of miles apart. As the subject was an important and interesting one we brought it before our readers, quoting from that journal with which we can reciprocate courtesies with pleasure, rather than from one with a quarrelsome habit. But even this careful avoidance of contact was not sufficient to prevent a false charge. As to "fair dealing," we have long ceased to expect it from that quarter, but we do object to untrue statements.

H. N. C.—There are three modes of dealing with the difficulty of the film becoming loose in the process of development, &c. The use of an adherent powdery collodion we have sometimes found prevented this evil; but it is not always easy to meet with the right kind. The use of alcohol and water, equal parts of methylated spirits and water, to moisten the film before development will often check the tendency of the film to slip, especially if the edges have been varnished. Finally, if these plans do not serve, there is the use of a preliminary coating of gelatine or india-rubber to fall back upon. In other respects the plates seem to work well. A little longer exposure would have been an improvement.

John Clusky.—The glass room you describe will, we doubt not, answer your purpose well.

Ignoramus.—We prefer the side light to face north or north-east; the south side may be glazed with ground glass. Black and white for blinds will answer very well.

W. S.—For ordinary stereoscopic work we should prefer the 6-inch focus in a single lens to the 4½-inch. 2. The developer should vary with circumstances; in hot weather less iron and more acid should be used than in cold weather. A weak developer also requires relatively more acid than a strong one, because the process of development being slower, there is more time for fog, and hence the need for more acid. At this season of the year, 15 grains of protosulphate and 15 minims of glacial acetic acid in an ounce of water will work well; in summer you may use 10 grains of iron and 20 minims of the acid with advantage.

A Youngster.—The chief cause of your toning difficulty is in your negatives. Without a good negative it is impossible to obtain a brilliant print. Your negatives require a little more exposure and a little more brilliancy; then print sufficiently deep, and you will find no difficulty in getting deep tones. The defect you refer to as "milkiness" is known to photographers as *mealiness*. It most commonly arises from using the toning bath too soon after it is mixed. Your progress is very satisfactory for such a short time.

Enquirer. (Glenarm.) About half a drachm of gum in an ounce of water. 2. An ordinary single lens generally includes an angle of from 30° to 40°, the triple from 50° to 60°, with the stops usually employed; of the other we cannot speak with certainty, but probably between the two. 3. Not necessarily.

P. O. D.—The chief fault in the print is lack of vigour; you require more free nitrate, and a little more cotton in the collodion. 2. We have not tried them. 3. Yes; by adding a little soluble cotton, and also by adding a little of an alcoholic solution of nitrate of silver; especially the latter. 4. Either ordinary spirits of wine, or methylated; we use the latter for economy. 5. We have not had sufficient experience yet with organic additions to the collodion to speak of the result with certainty. 6. Two or three drops of the "harz oel" to an ounce of collodion will be sufficient. 7. Yes.

C. M. asks who was the inventor of stained glass vignette plates. So far as we remember, it was Mr. Forrest, of Liverpool. Can any of our readers furnish definite information?

Enquirer.—Our experience does not enable us to give you any information on the subject. Probably our advertising columns may aid you.

J. R. J.—Thanks for your suggestion. It is, however, one which we had tried some time ago without success. As our collodio-chloride of silver also possesses free nitrate of silver, any addition of chloride of gold simply causes decomposition with precipitation of the gold.

W. H. Warner.—We will bear the matter in mind, and do our best.

G. B. B.—The difficulty of printing on ivory, in the usual way consists, as we have before stated, in the unequal absorption of the solutions. Hence, if the sensitive salts can be used in solution in a vehicle like collodion, they are easily distributed in an even layer over the surface. The Wothlytype printing process answers the purpose best, as in our collodio-chloride, the image remains in the film, whilst in the uranized collodion, it passes through and remains on the ivory, after the collodion is removed. It is not a matter of much importance; but it is perfectly true that we were the first to suggest, and the first to work out this mothod of printing on ivory.

P. Fletcher.—Received. Shall have our attention shortly.

Several correspondents in our next.

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Photographs Registered during the Past Week.

Mr. J. F. Trull Falmouth,
5 Photographs Views of Scenes in and around Falmouth.
Messrs. W. and D. Downey, 9, Eldon Square, Newcastle-on-Tyne,
Photographs of Duke of Northumberland,
Photograph of Earl Percy,
Phototgraph of Countess Percy.
Messrs. Barnes and Son, 422 Mile End Road,
Two Photographs of Solomou's Temple from an engraving.
Mr. A. Ayton, Londonderry,
Two Photographs, "a group," Miss Murray and Bradley, and Rev. J. M.'Groarty.
Messrs. W. and D. Downey, Eldon Green, Newcastle,
Four Photographs of G. R. Stephenson, Esq.
Mr. W. Mayland, Cambridge,
Two Photographs of the Cambridge Boat Crew, 1865.
Mr. W. H. Mason, Brighton,
Photograph of Dr. Pusey.
Messrs. Gramb Brothers, Glasgow,
Three Photographs of a gentleman.
One Photograph of a lady.
Mr. W. Dawson, Bellhouse, Leeds,
Photograph of Howley Hall,
Photograph of John Harrison,
Photograph of Ralph Thoresby,
Photograph of the ancient views of Leeds.
Mr. George Bell, Trongate, Glasgow.
Three Photographs of McDowall Stuart, Esq.
Mr. G. R. Gill, Kentish Town,
Photograph entitled "The Dream."
Messrs. Gramb Brothers, Glasgow,
Photograph of a Gentleman.

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THE PHOTOGRAPHIC NEWS.

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THE NEW METHOD OF INTENSIFYING.

Some further experience with Mr. Carey Lea's new method of intensifying by producing a non-actinic colour in negatives, confirms our first conjectures as to its probable utility; but also suggests the importance of caution in using a new power until the bounds of its capabilities are well understood and defined. We find that by the use of the new agent proposed a great variety of effects may be secured, and that it is equally possible to obtain just the best possible amount of printing intensity in a negative, or to spoil it altogether.

We have used, in our experiments, the double sulphide proposed, in one or two different forms, with equal success. As we before stated Schlippe's salt is not usually to be met with in commerce, and we preceded to prepare it for ourselves, and we asked Messrs. Hopkin and Williams to prepare us a sample also, with a view to testing an article which will probably be prepared commercially if a demand for it arise. These gentlemen kindly prepared us the salt from Mr. Carey Lea's formula. It consists of yellow tetrahedral crystals, which very readily decompose and become covered with an orange-coloured or brown powder. About twenty grains, in an ounce of water, are sufficient to produce the colouration in the negative. The major part of our experiments were, however, conducted with the sulphantimoniate we prepared ourselves. Although the instructions given by Mr. Lea are clear and simple it may be interesting to state briefly our own mode of preparing the solution. We took,

Grey sulphide of antimony	1 ounce
Common carbonate of soda	2 "
Freshly burnt lime	5½ drachms
Flowers of sulphur	1¼ "
Water	8 ounces.

A portion of the water was added to the lime and the whole then placed in a pint bottle and well shaken. This was then placed near the fire, where a temperature of about 140° was maintained, and the bottle shaken from time to time. At the end of about six hours all appearance of the grey sulphide of antimony was gone, a bulky white insoluble powder remained at the bottom, chiefly consisting of carbonate of lime and antimoniate of soda, and the clear, yellow, supernatant liquid was removed by filtration. This consisted of a concentrated solution of the double sulphide of antimony and sodium, or sulphantimoniate of soda, which would, on evaporation, have yielded crystals of Schlippe's salt. We did, not, however, attempt to crystallize it, our object being to try the action of the solution thus obtained, and thus save one operation. It answered the purpose admirably, one drachm of the solution in from one to two ounces of water being quite strong enough for the purpose intended, and giving, with proper preliminary treatment, any colour, from brown to scarlet.

We next proceeded to carry out Mr. Lea's instructions as to the preliminary treatment of the plate, the chief object of which appears to be to render the deposit of silver permeable and readily accessible to chemical action. A number of old plates, positives and negatives were subjected to treatment, some of which were first treated with bi-chloride of mercury, some with iodide of mercury, and some with a solution of tincture of iodine, followed by the sulphantimoniate solution in different degrees of concentration. Plates treated with bichloride of mercury until they were quite white, and then submitted to the action of a strong solution of the sulphantimoniate, at once became deep black, and very dence, without any trace of redness. Treated with a dilute solution of the new salt they assumed a delicate salmon colour, and with a solution a little stronger the colour produced was red. Plates treated with bichloride of mercury, followed by a dilute solution of iodide of potassium, at once assumed a deep non-actinic orange or red tint. Plates treated with a dilute tincture of iodine, or a solution of iodide of potassium in water, until they were of a greenish grey colour, and then submitted to a dilute solution of the sulphantimoniate, assumed a russet brown tint, both by reflected and transmitted light, which is very non-actinic and effective in printing. If the action of the iodine were continued until the negative were of a pale lemon colour, then it became orange on treatment with the sulphur salt; and if the action of the iodine was carried on until the negative became bright yellow, a bright transparent scarlet was produced by the Schlippe's salt.

With the preliminary mercury treatment, the negatives, no matter what colour was produced, always retained a certain amount of opacity; but with the iodine the effect was somewhat different. With the iodine applied for a short time only, a slight increase of opacity was observed; but as photographers know, if the action of iodine be continued, that opacity disappears in proportion as the colours tend towards yellow, until finally the densest parts of the negative will appear transparent, but of a very bright yellow in colour. When this stage is attained, the transparency remains after the application of the sulphantimoniate, and the densest parts of the image appear to be formed of bright orange or scarlet glass. If, however, the iodine treatment be continued only until the negative be of an olive grey, and the colour after final treatment of a russet brown, it is then quite opaque in the densest parts, and the colouring matter is quite superficial, not showing at all at the back of the plate, whilst in the former case it appears to permeate the entire film, and both sides of the negative appear red.

There is one danger in using the process, by no means a necessary one, but which might very easily be encountered if it were not pointed out. It is this: when the treatment with iodine is continued until the full yellow colour is obtained necessary in producing a bright scarlet, the operator may be surprised to see his film after it has assumed a beautiful scarlet, suddenly appear as if abraded in various places, with mottled or granular effect of surface. On again letting the water fall on it from the tap to remove the granular looking deposit where it is abraded, it becomes worse, and on touching the film with his finger, he finds the whole of the red deposit, and the image as well may be rubbed away, consisting of a loosely adherent or powdery film. Or it may leave his hands looking all right, but on drying, it assumes the same abraded appearance; the surface cracking in drying much in the same manner as when a plate is left unwashed, and a solution crystallized on its surface. The first impression is, that the film has been rotted from the action of the solutions to which it has been submitted; but on examination, it will be found that a thin film of collodion, quite clean, with only a phantom trace of an image, remains intact on the glass; but the chief portion of the image having been converted into a loosely coherent powdery layer is easily broken by a stream of water, and under some circumstances cracks in drying. The remedy is very plain; it is simply to avoid carrying the iodizing process so far, as a better result is obtained without incurring any danger, by stopping the action at an earlier stage.

The best effect, in our experience, is produced by submitting the negative to a solution of iodine one grain, and iodide of potassium two grains in an ounce of water. The action of this is not rapid, and is, therfore, under control. This succeeded, after washing with a dilute solution of sulphantimoniate, gives an even russet brown colour very effectually nonactinic. Stronger solutions of iodine act more rapidly, but are less under control, and more apt to cause stains. If solutions of the salts to be employed are kept in dishes or dipping baths with covers, a more even action is secured, as there is always some difficulty in covering the plate by pouring sufficiently quickly to prevent irregular action and stains. Care should be used to use the double sulphide in a well ventilated place, as sulphuretted hydrogen is given off in the decomposition induced on applying it to a plate.

Unlike the deposit produced by some similar modes of intensifying, this is not injured by varnishing. It has been a frequent source of disappointment to the photographer who has intensified a negative by salts of mercury, to see his dense image become perfectly transparent on applying the varnish. Those intensified by the new method, have, in our hands, retained their density perfectly after varnishing. The intensification has, moreover, been regular and even, increasing the force of the half tones, as well as the high lights, and giving harmonious prints. The range of power it will give remains to be proved by further experience; which, also, alone can determine its permanency and freedom from change under the action of light.

The dilute solution is easily decomposed, as, indeed, is a strong solution also on contact with any acid, the decomposition being accompanied with evolution of sulphuretted hydrogen and a deposit of a beautiful yellow colour, known, in old terminology, as the golden sulphuret of antimony, or sulphur auratum. The fingers are stained of a yellow brown by contact with the solution; this can be removed by a careful application of a caustic alkali. Both crystals and solutions should be kept in well-corked or stoppered bottles.

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SAFETY FROM FIRE—SOLUBLE GLASS.

BY AN OLD HAND.

As many photographic studios, theatres, music halls, and ball rooms have within the last year or so fallen a prey to that most destructive and devastating element, fire, the following article will be of interest to all who are desirous of rendering those places safe and secure. This may be done by the application of *soluble glass*, which is a simple silicate of *potassa* or *soda*, uniting perfect solubility in boiling water, to some of the general properties of common glass, in a liquid state it can be applied to *cloth* or *wood*, thereby rendering them incombustible, for by the evaporation of the water in which it is dissolved, a film of a substance capable of fusing when heated, is deposited on the *wood*, *cloth*, or other bodies, and protects them from the contact of air necessary for their combustion. With respect to the preparation and manufacture of the article, the best authority is a French work by *M. Dumas* "*Traité de Chimie appliqué aux Arts.*" and if some of the firms who have turned their attention to the manufacture of glass for photographic purposes, were to prepare the soluble article, there is very little doubt that when once known the demand would be very great, and the liquid composition most extensively used, as its peculiar properties fit it for many and various applications. All vegetable matters, wood, cotton, hemp, linen, paper, &c. are, as is well known, combustible, but in order that they shall burn, two conditions are necessary, an elevated temperature, and free contact of air. If deprived of such contact and made red hot, they will yield inflammable volatile products, but the carbon which is left will not burn, as it is deprived of air, and thus the combustion will stop of itself. Such is the part all fixed fusible salts are capable of performing, if they be, in addition, composed of substances incapable of yielding *oxygen*, at a low red heat to either *carbon* or *hydrogen*. These salts melt as the vegetable matter becomes heated, they form upon it a coat impenetrable to the air, and prevent altogether or limit its combustion. *Phosphate* and *borate* of *ammonia* have this character, but they are too readily soluble in cold water to be depended on, an objection not to be urged against *soluble glass*. The preservative quality of the glass is improved and more to be depended on when mixed with some other incombustible body in powder—acting in the same manner as the oil of painters giving the several coats more body, more durability, and more solidity, so that if the substance added be of the proper kind and quality, they coagulate by the action of fire into a strongly adhesive *preservative crust*. *Clay*, *whiting*, and *calcined bones* may be employed for the purpose; a mixture of clay and whiting has been found to be better than either used separately. *Calcined bones* form, with the soluble glass, a very solid and adhesive mass. *Litharge*, which, with the glass, makes an easily fusible mixture, does not answer well for coating wood, as the mixture contracts in drying, cracks, and is easily peeled off. *Flint* glass, and crude soluble glass, form an excellent compound; the latter ought to be exposed to the air after it is pulverized, in order to attract moisture. If it be then mixed with the solution, and applied to any body whatever, it will, in a short time, form a coating as hard as stone; and if the glass has been of good quality, is unalterable by exposure, and resists fire admirably. In applying the soluble glass to any article, the first coat should always be a simple solution of the glass, and a similar solution should be applied over coats composed of its mixture with other substances, particularly when the surface is uneven and rough. In order to cover the wood or other bodies with certainty, the solution must be made of pure glass, or it will effloresce, and finally fall off. In order to render the covering more durable, the solution employed at first must not be too strong, or it will not be properly absorbed—will not displace the air from the pores, and thereby not adhere firmly. It is a good plan to rub the brush several times over the same place, and not to spread the coating too lightly. For the last coats, a more concentrated solution may be used, spread over and applied as evenly as possible; each coat to be *thoroughly dry* before another is applied; this will take in warm and dry weather at least 24 hours. Some years back, the preparation of *soluble glass* was applied to the wood-work and scenery of the Theatre at *Munich*, the capital city of Bavaria—a place that has acquired a high name and reputation for its mathematical and optical instruments, jewellery, and glass. In this application of the solution, 10 per cent. of yellow ochre was added. After six months, the coating was found to have suffered but little change—damaged only in a few places where the application of the solution had not been careful and complete. In the security of theatres and concert rooms, it is not only necessary to preserve the wood-work, but also the scenery, borders, curtains, and those drapery decorations which are still more exposed to danger and destruction, and no method as yet proposed, is so likely to accomplish that wished-for and desirable end as *soluble glass*, for it is found not to act upon vegetable matter, and to completely fill up the space between the threads, fixing itself so firmly in the web, that it cannot be separated, and materially increasing the durability of the fabric. The firmness which it gives to stuffs, cords, and ropes, does not injure them for use nor prevent their being easily rolled; while, as regards the painting of scenes, draperies, and borders, the glass solution forms a good ground for the colours, it only being necessary to prevent the changes which some colours, such as lake and prussian blue might undergo (from the alkaline matter), to apply first a coat of alum, and then one of whiting. In applying the solution to cloths, &c., in addition to dipping them in the solution, it will be found necessary to submit them to a strong pressure, by passing them between rollers plunged in the solution. In the application of the solution to cloths, *litharge* may be added, as the stuff in drying yields to the shrinking of the mixture, and becomes inseparable from it, which is just the reverse of what happens when it is applied to wood; a single part of litharge, in fine powder, being sufficient for fourteen parts of concentrated liquor. There are many other ways in which *soluble glass* may be effectively and usefully employed, more particularly as a cement, for which purpose it is far superior to anything hitherto in use for uniting broken glass, porcelain, &c., &c., it may also be used in the place of glue or isinglass in applying or laying on of colours.

Soluble glass might be found to mix well with the prepared starch used for rendering ladies' dresses inflammable, and in that state applied as a first coat or priming to wood, canvas, paper, &c., for the interior of public buildings.

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PICTURES OF THE ST. LAWRENCE.

Taken in Autumn.

BY J. WERGE.

Photographs of the River St. Lawrence, conveying an adequate idea of its extent and varied aspects, could not be taken in a week, a month, or a year. It is only possible in this sketch to call attention to the most novel and striking features of this great and interesting river, passing them hurriedly, as I did, in the "express boat," by which I sailed from the Niagara River to Montreal. Lake Ontario being the great head waters of the St. Lawrence, and the natural connection between that river and Niagara, I shall endeavour to illustrate, with pen and pencil, my sail down the Niagara River, Lake Ontario, and the St. Lawrence. Stepping on board the steamer lying at Lewiston, seven miles below Niagara, and bound for Montreal, I went to the "clerk's office," paid seven and a half dollars—about thirty shillings sterling—and secured my bed, board, and passage for the trip. The above small sum being all that is charged for a first class passage on board those magnificent steamers. I don't remember the name of "our boat," but that is of very little consequence, though I dare say it was the "*Fulton*;" that being in steam-boat nomenclature what "Washington" is to men, cities, and towns, and even territory, in America. But she was a splendid vessel, nevertheless, with a handsome dining saloon, a fine upper saloon running the whole length of the upper deck, about 200 feet, an elegant "ladies saloon," a stateroom cabin as well, and a powerful "walking engine." "All aboard," and "let go," splash went the paddle-wheels, and we moved off majestically, going slowly down the river until we passed Fort Niagara on the American side, and Fort George on the British, at the foot of the river, and near the entrance to the Lake. On Fort Niagara, the "*Star Spangled Banner*" was floating, its bright blue field blending with the clear blue sky of an autumn afternoon, its starry representatives of each State shining like stars in the deep blue vault of heaven, its red and white bars—thirteen in number, as pure in colour as the white clouds and crimson streaks of the west. The mingled crosses of St. Andrew and St. George were waving proudly over the fort opposite. Brave old flag, long may you wave! These forts played their respective parts amidst the din of battle during the wars of 1812 and 1813; but with these we have neither time nor inclination to deal; we, like the waters of the Niagara, are in a hurry to reach the bosom of Lake Ontario. Passing the forts we were soon on the expanse of waters, and being fairly "at sea," we began to settle ourselves and "take stock," as it were of our fellow travellers. It is useless to describe the aspect of the Lake, I might as well describe the German Ocean, for I could not see much difference between that and Lake Ontario, except that I could not sniff the iodine from the weeds drying in the sun, while we "hugged the shore," or taste salt air after we were out in mid ocean—"the land is no longer in view."

To be at sea is to be at sea, no matter whether it is on a fresh water ocean or a salt one. The sights, the sensations, and consequences are much the same. There, a ship or two in full sail; here, a passenger or two, of both sexes, with the "wind taken out of their sails." The "old salts," or "old freshes" behave themselves much as usual, and so do the "green" ones of both atmospheres—the latter by preparing for a "bath" of perspiration and throwing everything down the "sink," or into the sea; and the former by picking out companions for the voyage. Being myself an "old salt," and tumbling in with one or two of a "fellow feeling wondrous kind," we were soon on as good terms as if we had known each other for years. After "supper," a sumptuous repast at 6, p.m., we went on to the "hurricane deck" to enjoy the calm and pleasant evening outside. There was a "gentle swell" on the Lake—not much, but enough to upset a few. After dark, we went into the "ladies cabin"—an elegant saloon, beautifully furnished, and not without a grand piano, where the "old freshes" of the softer sex—young and pretty ones too, were amusing themselves with playing and singing. An impromptu concert was soon formed, and a few very good pieces of music well played and sung. All went off very well, while nothing but English, or I should more properly say, American and Canadian were sung; but one young lady, unfortunately, essayed one of the sweetest and most plaintive of Scotch songs—Annie Laurie. Now fancy the love-sick "callant" for the sake of Annie Laurie lying down to *die*, just fancy Annie Laurie without the Scotch, only fancy Annie Laurie in a sort of mixture of Canadianisms and Americanisms; fancy "toddy" without the whisky, and you have some idea of Annie Laurie, as sung on board the "*Fulton*," while splashing away on Lake Ontario, somewhere between America and Canada. There being little more to induce us to remain there, and by the ship's regulations, it was getting near the time for "all lights out" in the cabins, we took an early "turn in," with the view of making an early "turn out," so as to be alive and about when we should enter the St. Lawrence, which we did about 6 o' clock a.m., on a fine bright morning, the sun just rising to light up and "heighten" all the glorious tints of the trees on the Thousand and One Islands, among which we were now sailing. It is impossible to form a correct idea of the width of the St. Laurence at the head of the river. The islands are so large and numerous, it is difficult to come to a conclusion whether you are on a river or on a lake. Many of these islands are thickly wooded, so that they look more like the main land on each side of you as the steamer glides down "mid channel" between them. The various and brilliant tints of the foliage of the trees of America in autumn are gorgeous, such as never can be seen in this country; and their "chromotones" present an insurmountable difficulty to a photographer with his double achromatic lens and camera. Imagine our oaks clothed with leaves, possessing all the varieties of red tints, from brilliant carmine down to burnt sienna, the brightest copper bays that grow in England are cool in tone compared with them; fancy our beeches, birches, and ashes thick with leaves of a bright yellow colour from gamboge down to yellow ochre. Our pines, firs, larches, and spruces, carrying all the varieties of green, from emerald down to terra verte; in fact, all the tints that are, can be seen on the trees when they are going into "the sere and yellow leaf" of Autumn, excepting *blue*, and even that is supplied by the bluebirds (sialia Wilsonii) flitting about among the leaves, and in the deep cool tint of the sky, repeated and blended with the reflection of the many coloured trees in the calm still water of the river. Some of the trees—the maples for instance—exhibit in themselves, most vividly, the brightest shades of red, green, and yellow; but when the wind blows these resplendent colours about, the atmosphere is like a mammoth kaleidoscope that is never allowed to rest long enough to present to the eye a symmetrical figure or pattern, a perfect chaos of the most vivid and brilliant colours too gorgeous to depict. Long before this we had got clear of the islands at the foot of the lake and head of the river, and were steaming swiftly down the broad St. Lawrence. It is difficult to say how broad, but it varied from three to five or six miles in width; indeed, the river very much resembles the Balloch End, which is the broadest of Lochlomond; and some of the passages between the islands are very similar to the straits between the "Pass of Balmaha" and the island of Inchcailliach. The river is not hemmed in with such mountains as Ben Lomond and Ben Dhu, but, in many respects, the St. Lawrence very much resembles parts of our widest lakes, Lochlomond and Windermere. Having enjoyed the sight of the bright beautiful scenery and the fresh morning air for a couple of hours, we were summoned to breakfast by the sound of the steward's "Big Ben." Descending to the lower cabin we seated ourselves at the breakfast table, and partook of a most hearty meal. All the meals on board these steamers are served in the most sumptuous style. During the repast some talked politics, some dollars and cents, others were speculating on how we should get down the Rapids, and when we should make them. Among the latter was myself, for I had seen rapids which I had not the slightest desire to be in or on; and, what sort of rapids we were coming to was of some importance to all who had not been on them. But everybody seemed anxious to be "on deck," and again "look out" for the quickening of the stream, or when the first "white lippers," should give indication of their whereabouts. My fellow passengers were from all parts of the Union, the Yankee "guessed," the Southerner "reckoned," and the Western man "calculated" we should soon be among the "jumpers." Each one every now and then strained his eyes "a head," down stream to see if he could descry "broken water." At last an old riverman sung out "there they are." There are the Longue Sault Rapids the first we reach. Having plenty of "daylight," we did not feel much anxiety as we neared them, which we quickly did, for "the stream runs fast." We were soon among the jumping waters, and it is somewhat difficult to describe the sensation, somewhat difficult to find a comparison of a suitable character. It is not like being at sea in a ship in a "dead calm." The vessel does not "roll" with such solemn dignity, nor does she "pitch" and rise again so buoyantly as an Atlantic steamer (strange enough I once crossed the Atlantic in the steamship "Niagara,") as she ploughs her way westward or eastward in a "head wind," and through a head sea. She rather kicks and jerks, and is let "down a peg" or two, with a shake and a fling. Did you ever ride a spavined horse down a hill? If so, you can form some idea of the manner in which we were let down the Longue Sault and Cedar Rapids and the St. Louis Cascades. One of our fellow passengers, a Scotchman, told that somewhat apropos and humorous story of the "Hielandman's" first trip across the Frith of Forth in a "nasty sea." Feeling a little uneasy about the stomach and his bile being rather disturbed, the prostrate mountaineer cried out to the man at the "tiller" to "stop tickling the beast's tail, what was he making the animal kick that way for?" And so, telling our stories, and cracking our jokes, we spent the time until our swift vessel brought us to a landing, where we leave her and go on board a smaller boat, one more suitable for the descent of the more dangerous rapids, which we have yet to come to.

(To be continued.)

MINOR IMPROVEMENTS CONNECTED WITH PRINTING.

BY ALFRED HUGHES.*

As photographers, both amateur and professional, are now beginning to think of a new season of work, and of the best means to produce that work, perhaps the following hints connected with printing may not be out of place. They are not original, but are derived from the systems of different practical men, united with some personal modifications.

There are various small things in photography, as in everything else, which, if properly attended to, unite to make "one harmonious whole;" such, for instance, as the selection of a suitable collodion for the subject; the adaptation of the bath and developer to it; the choosing a paper so that the printing may not be too hard or too soft; the determining the most desirable tone, whether warm, neutral, or cold; brown, black, or grey; and if the print has to be vignetted, there is the selecting the most appropriate contour, the trimming it to the most desirable size, and even the mounting it on the most proportional cardboard. Now, if all or any of these minor points are neglected, the final picture will suffer, but if they are attended to the united effect of these little things forms a great improvement.

I speak of these as *little things* and *minor points*, to distinguish them from the main or great things which always engross the minds of photographers, such as the position and lighting of the subject, the exposure and cleanliness of the negative, and the proper depth of printing. That these secondary points are also worthy of consideration is proved by the fact known to all experienced persons, that two men may take the same negatives and materials, and one will produce hard, mechanical prints, utterly wanting in taste and feeling, while those of the other will be delicate and artistic, the only distinction being in some *small* variation of working, or a variety of minute differences.

Photographers have often much trouble with hard-featured sitters, persons with deepset lines, innumerable freckles or swarthy skin, which defects are exaggerated in the negative, unless skilfully managed in lighting and exposure.

Even under the hands of the most clever operators, these imperfections will sometimes show too really to be agreeable to the customer, and then the skill of the printer is taxed.

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* Read at a Meeting of the Glasgow Photographic Association on Thursday, April 6th.

With the aid of some cobalt blue, or Newman's cold neutral tint, one can considerably modify these effects, or defects, by delicately touching the negative, as a very dilute wash of either in the lines or shadows that printed black before, enables them to appear a grey in the finished print. To do this well requires care and a little practice, and at all times to watch the likeness rigidly that it be not injured.

It sometimes happens that, after a negative is varnished, it is found not to be intense enough, and a ready remedy is to coat the negative on the varnished side with the following:—

[*]Ordinary spirit varnish .. ... 1 ounce
Iodine ... ... 1 grain.

On its application there is no visible effect, but the negative rapidly darkens in the light, and is made more intense.

Care must be taken in allowing this yellow varnish to remain on the negative as short a time as convenient, as, if the time be prolonged, a yellow colour appears in the high lights, which rapidly goes to the shadows, and the image *becomes flattened*, and the intensity is *taken away*. In heating the plate to dry the varnish care also must be taken, as the intensity increases with the heat.

It occurs sometimes that a part of a negative may print too dark, such as a back-ground in a vignette, or a sky in a landscape; or it may be the opposite. There may be indications of clouds in the sky, which will not print sufficiently, or a face in a portrait may be nearly white, while the dress is almost bronzed.

The usual mode of overcoming these difficulties is to mask the dark parts, during a portion of the time of printing with blackened paper or cardboard, cut out so as to fit the outline as nearly as possible, and thus retard the printing where a lighter shade is required; but in the case of a dark vignette background, or a landscape with delicate distance, the masking is too hard and coarse to produce a finished effect. A more perfect means is by dissolving iodine in the spirit varnish, in proportions varying according to the intensity of the negative, and pouring over *the back* of the negative, this yellow varnish, and then carefully scraping it away where the intensity is too great, allowing about one-sixteenth of an inch "in," to allow for diffraction of light through the glass. The yellow varnish thus applied will prevent the dark portions printing so quickly, while the parts left unprotected may be allowed to print deeper, and thus the original violence of contrast in the negative may be avoided. This method of masking is so delicate in outline, as to be imperceptible in the print.

Very pretty effects in vignetting, and delicate clouds in views, may be sketched on the back of a negative, by means of iodine dissolved in a benzole varnish; this latter not requiring heat, allows the operator time to carefully paint the effects wished.

It is quite possible to apply the benzole yellow varnish by a brush to the *front* of a negative, as, for instance, the interior of a church, where the shadows are black, and the windows white. In this case, the varnish must be painted on the windows until the intensity be sufficiently *reduced*. The increasing primrose yellow indicating the decreasing density.

In passing, it may be remarked that the yellow spirit varnish is excellent for the windows of dark rooms, being perfectly trustworthy and inexpensive.

There is a fashion coming in for vignettes with a slightly tinted ground in place of being white, and the demand for them would no doubt increase, could they be produced easier than at present.

The usual plan is to vignette the portrait in the regular way, and after carefully superimposing cotton wool on the printed part, to tint the white margin. A much neater way is to take an opaque colour, cold sepia is best, and carefully paint out the face, shirt front, or other white portions, and then do the tinting. Attention must be paid to two things. First, to have plenty of colour in the brush, so as to render the painted parts quite impervious to light; and second, not to draw the brush over the same place twice, but dab or stipple it, as washing on the colour removes the upper coat of nitrate of silver, and causes unequal toning. A little practice is all that is required. The same method will apply to oval-masked and cameo portraits. Gamboge would naturally suggest itself as a good colour for this purpose, but it must not be used, as it leaves a yellow stain.

The difficulty of putting in back-grounds either in plain or albumenized papers, may be materially lessened by this method of carefully painting with opaque colour the outline of the figure an eighth or a quarter of an inch in, and with blackened paper masking the rest. By this means, one can preserve the outline of a face, the most difficult of all, where, by using paper for the outline as in ordinary masking, it would be impossible.

In plain paper, the part to be painted must first be covered with strong gum to prevent the colour sinking into the paper.

In all these cases named, the colour is removed easily in the washing of the prints, previous to toning.

The colour of a print in the pressure frame greatly depends upon the intensity of a negative, the light in which it is printed, and the amount of glass the light has to penetrate. If a back-ground is to be put in or a sky tinted, the colour of the print must be noticed; if red, then the tint must be done through thick green glass, and in the deep shade; if bluish, in stronger light, and through thinner glass. It is important to remember this, as the final effect can thus be materially modified.

There are many photographers who have valuable negatives which, having been intensified with bichloride of mercury alone, or in conjunction with an iodide, have become, by exposure in printing, so hard and intense as to be utterly useless. With a little care, they can be restored to their pristine beauty, viz., by roasting them. They should be subjected to heat until, by transmitted light, they have a slight primrose yellow tint in the high-lights while hot, which tint, however, disappears on cooling. A long subjection to a gentle heat is best. Even when they become hard again, as they will by renewed printing, the same treatment will restore them. After heating, it is best to revarnish them. This method has been mentioned before, but attention is called to it again from its extreme value.

The troubles in photographic printing are very numerous, but one of the chief is mealiness. This may be caused by defective paper, bad silver, or an indifferent toning bath. By far the most numerous cases of mealiness may be safely attributed to the silver or toning.

The silver may be too weak to be in correct relation to the salting of the paper, and thus often cause the coarse granulation.

Another way of silver affecting the print is by partially dissolving the albumen. The other day a suspicious-looking sample of silver, the crystals having a peculiar flowery appearance, the solution of which was neutral to test paper, was found to partially dissolve the albumen, and as the paper was hung to dry, the albumen ran in streaks down the surface. The prints in the toning were very unequal and mealy. The appearance of them was as if there had been gross carelessness in albumenizing the paper. Another sample of nitrate of silver, acid to litmus paper, produced good prints.

With regard to mealiness due to imperfect toning, there have been endless formulæ for baths, and a great variety of salts used to neutralize chloride of gold. Acetate of soda is decidedly the favourite salt used now, but even this has not been successful in the hands of some printers.

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[*] This varnish is a modification of Mr. Simpson's plan of intensifying negatives with iodine, and has been described before. Mention is here made of it solely to point out its uses, and how to avoid failure with it.

The supposed advantage of carbonate of soda is, that it can be used at once, but then the gold is precipitated on keeping the toning bath.

Acetates of soda or lime, or better, chloride of lime, seem to prevent this precipitation; but they all, more or less, must be kept in conjunction with the gold some time before the bath is fit to use. If baths formed by these salts are not "ripe" enough, then comes that bugbear, mealiness.

A toning bath is wanted that may be thoroughly depended upon for working well at once, and that will also keep.

For uniting these advantages tungstate of soda seems decidedly preferable to any of the salts in general use. The bath can be used at once, will keep, and is the least liable to mealiness. To make the bath, take the chloride of gold and just neutralize with tungstate of soda, and then to each grain of gold add twenty grains of the tungstate; dilute with boiling *distilled* water, and when cool the bath is ready for use. Distilled water is mentioned, as common waters vary so much that they sometimes upset all formulæ. In strengthening this toning bath the gold may be simply neutralized with the tungstate; the excess not being required.

This bath can be kept and strengthened from day to day as required, *ad infinitum*.

There have been complaints about acetates, phosphates, and other organic salts producing tones that will not stand hot-pressing without losing their richness. If the cause be, because the salts are *organic*, the tungstate of soda, being inorganic, removes the difficulty.

From a calculation of many months with this bath, it is found to tone to a rich purple, one and a quarter sheet of paper of thirty-two cards to a sheet, with one grain of chloride of gold.

Confidence is placed in this toning bath from its working so uniformly well for nearly twelve months, during which time the original bath has been in constant use. Thousands of prints, on all kinds of papers, from every variety of negative, having been toned in it to good rich colours without any mealiness, and it is not believed that such constantly uniform results can be obtained by any other toning bath.

These hints on minor points connected with printing, though fortified by the results of practical experience, are submitted with diffidence, but should they be esteemed to be of value, the writer will be fully repaid for connecting them together.

MARSEILLES PHOTOGRAPHIC SOCIETY.

REPORT ON THE PRIZE COMPETITION FOR ENLARGED PROOFS.

At the meeting of this Society held on the 15th ult, the Secretary communicated the decision of the members of the jury appointed to examine the proofs sent in for the competition for enlarged pictures. We give the report of the Secretary, M. Leon Vidal, together with the decision of the jury:—

Gentlemen,—One of the most interesting applications of the art of photography is certainly that which has for its object the enlargement of positive proofs, obtained by the aid of apparatus of minimum size and consequently exceedingly portable.

You were of this opinion when you promoted a competition in this special branch of our art. The competition is now over: the members of the jury have conveyed to you their decision, and it is the result of their intelligent appreciation that I have now the honour of submitting to you.

But first permit me to thank in your name the members of the jury for the kind assistance they have rendered upon the occasion; their hearty co-operation could not fail to add an indisputable authority and value to the prize founded by you, I therefore am sanguine that you will unanimously approve of the proposition that I have now the honour of submitting to you—to present to M. M. Niepce de Saint Victor, Ed. Becquerel, Poitevin, Secretan and Hermagis the expression of our hearty thanks.

The proofs indicated under No. 3 are those which have *unanimously* obtained the prize: the honour of this distinction belongs to M. Van Monckhoven. These proofs had previously excited your admiration, and each one of you, while deferring to the decision of the jury, had certainly anticipated it. I am sure, then, that you will unanimously sanction this decision by awarding to Dr. Van Monckhoven of Ghent, the gold medal for his enlarged portraits, and the silver medal for his enlarged views. None of you can be ignorant of the important labours of Dr. Van Monckhoven, whose persevering efforts have so greatly contributed to the progress of the photographic art.

His special studies in enlarging had previously won for him the praises of the periodical press of Germany, England and France, and I am happy to be the interpreter to him of your sincere and sympathic congratulations.

The jury, according to the conditions of the competition, having only these two prizes to award, have not considered it necessary to deviate from the line marked out by naming the other competitors, notwithstanding the truly excellent qualities of the proofs submitted to their scrutiny.

In this particular also, our society must defer entirely to the decision of the jury; but although we may not be permitted to make known the names of the other competitors, we may at least thank every one of them for having taken part in the contest, and more especially for the successful efforts they have made to advance the art of enlarging.

One word more as to the terms of the report, the proofs, it says, have been examined exclusively with reference to their clearness and distinctness, and not to their artistic merits.

In this, gentlemen, our wishes were confirmed, and we may congratulate ourselves that a perfect unanimity of ideas has existed between the members of the jury and ourselves.

The artistic is completely distinct from the scientific point of view which specially occupies the attention of persons devoted to the advancement of photography. What we particularly desire is the perfection of processes and apparatus: it is the improvement of all the mechanical, optical, chemical, in one word, of all the scientific means that must contribute to the progress of an art already so marvellous.

In proposing a competition for enlargements, our society could only have in view the perfection of the optical apparatus tested by results, and it is from this point of view that Dr. Van Monckhoven has obtained the unanimous vote of the jury in his favour, which, however, does not prevent his proofs being as conspicuous in their purely artistic aspect.

Faithful to the path of initiation and progress, upon which our society has entered, in giving these prizes it has had particularly in view the attracting the attention of the photographic world to one of the most interesting questions of the day, that of encouraging, in a limited sphere, the efforts of enquirers devoted to optical science, which, in a photographic point of view, has still so many conquests to make before it is exhausted. We can only wish for the realization of this idea.

In conclusion, gentlemen, it only remains for me to ask you to sanction the decision of the Paris jury. The decision of the jury is conveyed in the following report:—

The undersigned, in reply to the request of the Photographic Society of Marseilles to judge the photographic proofs obtained by enlarging, met in the Museum of Natural History, and examined the proofs sent by the society with reference to the five competitors designated by numbers in the letter which accompanied them.

Examining the competitive proofs exclusively with regard to distinctness, and not with reference to their artistic merit, they have unanimously decided that the proofs numbered 3 must be considered as superior to those of the other competitors, and that their author is, in consequence. entitled to receive the prize offered by the society.

Paris, *10th February*, 1863.
Signed—M. M. Edmond Becquerel,
Hermagis,
Niepce de Saint Victor,
Poitevin,
Secretan.

The president put the conclusions of the report to the vote, and they were unanimously adopted.—*Le Moniteur de la Photographie.*

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ON THE PREPARATION OF NITRATE OF SILVER FOR PHOTOGRAPHIC PURPOSES.

BY DR. VAN MONCKHOVEN.

Nitrate of silver is employed in photography principally for the silver bath for sensitizing collodion plates, and sensitizing positive paper. For this latter purpose, crystallized nitrate of silver is generally preferred, and fused nitrate may also be employed, provided some drops of nitric acid be added to the solution:—the result will be the same, that is to say, almost always good. It is not the same, however, with the nitrate employed for sensitizing collodion plates, and ten samples of nitrate from different sources will frequently give ten different results, with regard to the sensibility of the collodion films, the purity of their development, and the duration of this development.

It frequently happens that a new silver bath gives dull fogged negatives, without vigour; and what is very remarkable is, that the fog is neither *under* the collodion film, as if the glass plate had been badly cleaned, nor *upon* the film, as if it had been exposed to light before development, but rather *in* the film, under the form of reduced particles which completely envelope it. Doubtless by adding acetic acid to such a bath, and by employing collodion coloured red by free iodine, the fog is diminished, but it does not wholly disappear. A new bath may sometimes yield passably good results, but the development may be very slow—and, what in the operating room is a great source of inconvenience, persons who have sat for their portraits must wait several minutes before it can be ascertained whether their portraits are good or not.

Again, it often occurs that a new bath yields very good pictures, but on condition of a very long exposure of the collodion film in the camera; in a word, the film is deficient in sensitiveness.

These are the three principal failures caused by the samples of nitrate of silver met with in commerce, and these failures may always be attributed to a faulty mode of preparing this substance.

We will now proceed to examine the various samples of nitrate found in the market.

First, the *crystallized* nitrate. In opening the bottle containing it, the smell of nitric acid is almost always perceptible. Dissolved in water, there is a strong acid reaction. This is because the nitrate has been crystallized in the same acid that has served to attack the metallic silver. It contains not only nitric acid, but all the other oxides of nitrogen contained in the mother waters in which it was crystallized. Such a nitrate communicates to the collodion plates a very clean development, but also great lack of sensitiveness.

Second, a grey *fused* nitrate. Dissolved in water, it deposits a grey powder of metallic silver, and the solution has a decidedly alkaline reaction. This bath gives very sensitive collodion films, but often fogged, and fogged in the substance of the film. It matters little that this collodion be neutral (of a pale straw colour, or white), there is a reduction of silver, which takes place rapidly in the film upon the application of the developer, hence the fogging.

Lastly, there is the *white* fused nitrate, prepared in various ways. The one gives films excellent in every respect, the other participates in the fused nitrate, and a third gives insensitive films, upon which the picture appears but very slowly during development. Thus, we perceive that there is every inducement for the photographer to prepare for his own use the nitrate of silver intended for the *negative* bath for collodion, for we repeat, the nitrate for positives does not present any of these anomalies.

The following is the manner in which the operation must be performed, and I call special attention to the passages in this article printed in italics.

Take a capsule of about 6½ inches diameter, place it over a spirit lamp with a double current of air, and put into the capsule 4 new five franc pieces, or if preferred, 100 grammes of pure silver. The pure silver of commerce always contains some traces of copper; coin contains one-tenth, but this copper, far from being a disadvantage, is, on the contrary, very advantageous, as we shall show. *It is important not to prepare more than* 100 *grammes (*1542 *grains), of silver at one time.* Pour upon the silver in the porcelain capsule 100 grammes of water, and 100 grammes of pure nitric acid. Then apply the heat of the spirit lamp. The silver, which was not attacked by the cold acid, soon disengages bubbles of gas, and in proportion, as the temperature increases, the bubbles are given off more abundantly, and the action becomes very vigorous. The moment soon arrives when we perceive the red fumes of hyponitrous acid given off, and *this must be checked* as soon as possible by the addition of a little distilled water. *It is of the first importance that the silver be attacked and dissolved without the disengagement of red fumes*, which, in the first place, constitute a notable loss of the nitric acid employed, and in the second place, cause the production of bad nitrate. It is true that by thus dissolving the silver in a nitric acid much diluted with water, the operation is much prolonged, but the product obtained is much purer. We put successively into the capsule nitric acid and water, until all the metal is completely dissolved. It is, however, only when we perceive the attack slacken that we add the acid, and when we see the red fumes make their appearance that we add the water.

The metal being dissolved (and by operating in this manner a much smaller quantity of nitric acid than usual is required), the solution is gently evaporated by the flame of the alcohol until the product in the capsule swells up by the disengagement of the last aqueous and acid vapours. This is the most delicate point of the whole operation.

Generally, the nitrate is fused at this moment, then the temperature is raised to decompose the nitrate of copper. This is a great mistake, for in consequence, the nitrate communicates to the collodion films a great degree of insensitiveness and a tendency to fogging the pictures. Instead of raising the temperature when the product swells, the product should always be stirred with a glass rod, and the temperature kept steady, during the quiet fusion of the nitrate, which, in this case, is bluish green, and not black*. We pour it in this state upon a porcelain slab, and immediately put it into bottles, for it attracts moisture from the atmosphere in consequence of the nitrate of copper it contains, which is very deliquescent.

The nitrate of silver thus prepared and dissolved in water is *neutral* to litmus paper, and communicates the maximum of sensibility to collodion films. This solution is blue, but the nitrate of copper, which is the cause of this colour, exercises no effect in the bath.

If it be desired to prepare crystallized nitrate, the operation is stopped as soon as the metallic silver is dissolved. Upon cooling, the liquid deposits crystals, which are collected in a funnel to drain. The crystals are afterwards dried upon a porcelain plate in a stove or oven.

The mother waters are evaporated and reduced to the state of fused nitrate.

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* For this reason, silver containing copper is to be preferred to pure copper.

If it be desired to obtain white nitrate of silver, the metal is first dissolved in the acid mixture, and the excess of acid driven off by evaporation. The mass is redissolved in water, filtered, and ammonia added to the solution until the liquid becomes limpid. Sulphite of ammonia is then added, and the whole left to settle for four and twenty hours, at the expiration of which time, all the silver is precipitated in a *pure* state. After being washed in water, it is dissolved in a mixture of two parts water and pure nitric acid, then evaporated to fusion.

The employment of sulphite of ammonia to precipitate pure silver will form the subject of another communication. *—Le Moniteur de la Photographie.*

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COLLODION.

BY PROF. J. MILTON SANDERS.*

As we sit down to compose this article, the memory of other days becomes awakened. We behold the little room where we first astonished the whole world, "and the rest of mankind," through the marvels perpetrated by aid of our ponderous camera. The world had then just recovered from its astonishment caused by the numerous tokens of M. Daguerre; for that great magician had at length caught the "silver sunbeam," and had fixed it firmly upon the metal plate. The world was all amazement, for the standing prediction of the chemist,—that the evanescent and shadowy picture of the camera obscura could not be fixed,—had been refuted.

We say that our memory reverted to the little room where we presided over an enormous camera, and where we transferred many wondering and incredulous countenances to the plate, there to remain in iodine, until the action of the atmosphere had faded them away.

In our mind's eye, an individual enters the room, his features indicating curiosity, not unmingled with slight expression of fear. He is incredulous—don't believe a word of it, and wouldn't if he was to see it. We reasoned the case with him, explained the solution of the wonderful action of light (as far as it was then known), showed him specimens, and at last he became convinced that even his own features could be transferred to the magical plate.

The formidable preparations for the process commenced, elbow grease is not spared, and often sweating (and swearing we were going to say), the plate is finally prepared for the iodine box. A few seconds over that substance rendered it ready for the camera, and in a moment more we stand before the patient. During the busy preparations aforesaid, the individual has been undergoing extensive beautifications. The hair brush and comb have been plied lustily, and a coating of infallible hair oil has fastened down the stray hairs and brightened the whiskers. He quickly takes his seat with that will of inflexible determination upon his features indicative of the resolution he had formed to endure heroically all that may be inflicted upon him.

"Just look into the camera, if you please, for only one minute and a-half, and don't breathe, nor wink, nor turn; are you ready? Now sit perfectly still, and if a fly gets on your nose I'll touch him off."

The patient in the meanwhile has screwed his determination up to the sticking point, he has taken in a deep inspiration preparatory for the long breathless spell, and fixing his gaze into the tube, he commences to stare at it with the firmness and determination of one who had fully made up his mind to sit the allotted time breathless and winkless, though they would have to cease revolving and making him to swear in the meantime.

For fifteen seconds he sits as immovable as the corpus on a dissecting table, but soon feeling the oppression occasioned by the want of breath, he gives egress to a further part of that confined in his lung, and his features relax correspondingly. Again another portion of air escapes, and another relaxation of the features ensue, but the resolute individual sits immovable, gazing firmly into the camera. Only two more relaxations of the features ensued, when time is up. With an ejaculation of joy he springs from the chair, with that feeling of relief one is supposed to experience who has gone through the preliminary preparations for having a token extended. Finally the mercury performs its duty, and the picture is brought out to view. Although the several relaxations of the features have blurred considerably, the quick eye of the individual discovers the resemblance of himself in them. He seizes it with rapture, and rushes out of the gallery to exhibit it in triumph to his astonished friends.

If the reader will pardon this lengthy digression, we will at once strive to come to the point. As the caption of this article indicates, we submit a few remarks upon the subject of collodion. We do not believe that the subject is yet exhausted, but that much remains to be learned about it. We have not yet reached perfection in it, for there are, doubtless, other "dodges," still to be discovered of incalculable value. We do not profess to have made that discovery—in fact we have made no discovery at all—for the addition of gutta-percha to collodion has been used long ago.

In our opinion gutta-percha collodion possesses desiderata not obtainable otherwise. It makes the surface of the film smoother, and more like the old albumen film. It gives it more tenacity and makes it adhere to the plate more firmly. It makes the collodion more sensitive and gives an intenser negative, with finer detail. The cadmium salts are always the best for this kind of collodion, and the latter should not be too old. To sixteen ounces of plain collodion, and eighty grains of iodide, and forty grains of bromide of cadmium. In another bottle, *pure* gutta percha should be dissolved in pure chloroform to saturation. About two ounces of the collodion should be poured into a small vial, and a few drops of the gutta-percha solution added. But a small quantity of the collodion should be used, as the gutta-percha deteriorates it in the course of a day or two, and frequently in a few hours. It sometimes happens that the gutta-percha solution will separate from the collodion, or gelatinize it, but if the gutta-percha be perfectly pure, and also the chloroform, this may not happen. But even in this case, it is not invariably so, for temperature has something to do with it, and perhaps likewise other causes not yet understood. Some of the finest negatives we have ever taken were obtained with this gutta-percha collodion. We have tried caoutchouc, and many other substances, but with much less success than gutta-percha. We find the latter to work much more efficiently in a hot than a cold climate, but in that case the plain collodion must contain at least two parts of alcohol to one of ether. The alcohol must be almost *absolute*, otherwise a failure will be the result.

We find that collodion not containing gutta-percha must contain at least two parts of alcohol to one part of ether, in order to work efficiently in the tropics. We spent one winter in the south side of the island of St. Domingo, where the heat is pretty intense, and especially in the summer. For awhile we could obtain no success, but by the adoption of an extra quantity of alcohol in our collodion, we worked without failures. For the benefit of those who have not taken pictures in the tropics, we would mention, that failures will frequently occur if the bath is of the usual forty or fifty-grain strength. It should be diluted down to at least thirty grains, and the strength of the collodion should correspond with this bath.

In conclusion, as we have had considerable success in the use of gutta-percha, we would recommend the subject to the consideration of your readers, many of whom possess superior abilities for such experiments.

New York, Feb. 10, 1865.

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* From the *American Journal of Photography.*

ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.*

M. Vial's Instantaneous Engraving.—M. Vial's process, as explained by himself, in the application of a scientific fact long since known, which is, that if we plunge a piece of one kind of metal (say steel, for instance) into a saline solution of a metal of an opposite nature (such as copper), the solution is immediately decomposed, and the metal reduced is precipitated upon the former, frequently with a considerable amount of adhesion. M. Vial says:—Such is my starting point, and without taking upon myself the scientific explanation of the phenomena, I shall confine myself merely to the description thereof.

The first process which I shall describe depends—

1st. Upon metallic precipitations.

2nd. Upon the relative affinity of acids for different metals.

It consists, firstly of making a drawing upon paper with a metallic ink, composed, for example, of a solution of sulphate of copper; and I may add, *en passent*, that a solution of the salt of any other metal, such as lead, bismuth, mercury, silver, &c., would produce the same effect, according to the metal desired to be engraved. When the drawing has been thus made it is placed, face downwards, upon a plate of zinc or steel, and next covered at the back with a piece of cloth slightly damped, and the whole is then submitted to a uniform pressure. About two minutes afterwards the design will be found transferred entirely, and with the greatest faithfulness, on to the metal plate, without any alteration or deterioration whatever of the original drawing. If instead of making the drawing upon paper, it is made more simply still, upon the metal itself (whether zinc or steel), with this metallic ink, the same phenomena are produced. In this state, in either the one case or the other, the design appears on the surface of the plate in slight relief formed by the deposit of copper, a solid and resisting body.

But in order to obtain a sufficient degree of relief for printing purposes, and more especially for surface printing, it is necessary to employ corrosion by acids or voltaic electricity, and this constitutes the second phase of the process. In fact, the acids, having a less degree of affinity for the copper than for the zinc, immediately attack the latter, whilst the former serves as a kind of protecting varnish to the lines.

I regard this process more from a scientific than an industrial point of view, for, having been very much occupied with carrying out my other processes, I have been forced to neglect this one; but I may add that it appears to me particularly applicable to the engraving of lace and other fabrics, which would only require to be impregnated with a solution of copper, to be transferred to the zinc, and then be engraved in relief.

I now come to my second process, or reproduction of old engravings. I employ two methods; the first, which I will call Process A, depends—

Firstly, Upon the antipathy of water for fatty bodies.

Secondly, As the preceding, upon the metallic precipitations, and the affinities of acids.

In fact, ordinary printing ink is greasy, and water, instead of having any attraction for it, is, on the contrary, repelled.

If, then, we place an engraving so as to float evenly with its back or wrong side upon a metallic solution, the aqueous liquid penetrates the paper slowly by imbibition, only around or between the lines formed of the greasy ink. After removing the proof from the bath, it is wiped lightly and placed with its face upon a plate of zinc, and a uniform pressure applied. The metallic salt of the solution is immediately decomposed, reduced, and precipitated on to the plate, which it covers all over with its metal (excepting where the lines of greasy ink occur) in such a manner as to give a negative image in relief, representing, with the greatest exactitude, the design or engraving which has served to produce it. A few moments are sufficient to produce this result; even photography does not operate with more promptitude and fidelity. Negative proofs may at once be taken from the plate by the ordinary printing process, which proofs, by repeating the process, will produce positive plates of zinc. Or the positive plates may be made by at once attacking the zinc, covered with the negative image, by means of a voltaic battery, or in a bath containing 10 per cent. of nitric acid. The metallic solutions which I at first employed upon zinc were formed with salts of lead, copper, or bismuth, but the chloride of gold has latterly yielded me the best results; this is readily explained, on the one hand, by the facility of reduction which the salts of gold possess, and on the other hand by the resistance which this metal offers to the attack of the acids. The solution is composed of about 2 parts of chloride of gold to 100 parts of distilled water.

This first method possesses the great advantage that it does not injure the original proof, which may thus be used an almost indefinite number of times, all that is necessary to remove the metal which is reduced on its surface, being to plunge it first into acidulated water, which dissolves the metal, and then into ordinary water, which removes all traces of the acid.

Guided by analogy, I have proceeded from these experiments to others, and it may not be without interest to speak of some of them, and to add that engravings may be transferred on to metals by impregnating them with alkaline solutions of chlorides, sulphurets, bromides, and iodides, and then applying them, as above, on plates of pure and silvered copper, which will then present, according to the heat to which they are submitted in drying them, images in iridescent colours of a very beautiful effect, with a slight relief caused, when operating upon plates silvered by means of mercury, by the volatilization of the latter metal by the heat.

This process of the reproduction of proofs by imbibition may be extended still further, and applied to engraving upon glass, and to printing woven fabrics. In the first case it suffices to impregnate the back of the engraving with hydrofluoric acid, and to apply it with its face upon the sheets of glass, which at once become dulled, and then engraved by the corrosive influence of the acid. In the second case, I propose to employ the chemical phenomena known by the name of double decompositions, and the following is the method of operating. The engraving is to be impregnated, as above, with pyrogallic acid, or with a mordant capable of re-acting upon a fabric previously impregnated with sulphate of iron, or otherwise suitably dyed, and then applied with a uniform pressure upon the stuff. The engraving may in this way be transferred to the fabric in a few minutes.

The phenomena are very simple; the pyrogallic acid transforms the sulphate of iron on the fabric into black pyrogallate of iron, and the mordant decolourises or fixes the dye of the fabric in all the white parts of the proof. The number of impressions which may thus be obtained is almost unlimited; the original engraving, after being washed, will serve as many times as may be desired.

My second method of reproducing old engravings, and which I will designate as process B, has for its objects, firstly, the transfer of the engraving; and, secondly, the engraving of the transfer, and depends—

1stly. Upon the transfer.

2ndly. Upon the phenomena of electro-chemistry.

The transferring of old engravings presents many difficulties; in fact, when a proof has been kept several years, the fatty body of the ink is completely resinified, and forms, with the carbon, an almost impenetrable mass, presenting a very great obstacle to the revival of the ink. If the ink employed is too liquid, the paper absorbs, little by little, all the greasy matter thereof, and thus another difficulty is encountered. On the other hand, the nature of the paper—its texture, porosity, and thickness, and the sizing which it has or has not undergone, are so many obstacles which have to be overcome.

After numerous experiments I have at length been enabled to surmount these difficulties almost completely by applying to the surface of the proof a preparation of petroleum or turpentine; the ink soon becomes impregnated therewith, and when the proof (slightly dried between two sheets of bibulous paper) is passed under the press in contact with a steel plate, this preparation, having a greater attraction for the plate than for the paper, soon becomes detached from the latter, carrying with it a small portion of the black of the ink.

I am perfectly convinced of the success of these transfers, but in order not to compromise the safety of bank-notes, drafts, &c., which can be faithfully transferred by this process, I shall not enter into the details of this manipulation, but pass on to the method of engraving such transfers.

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* Concluded from p. 113.

All that is necessary to effect this is to plunge the plate into a bath composed of a saturated solution of sulphate of copper, containing a small quantity of nitric acid, when the copper is immediately precipitated upon the plate in all its metallic brilliancy, leaving, however, the lines intact, so that the copper then serves as a varnish to resist the acid, whilst the steel, having a greater affinity than the copper for the acid, is corroded or "bitten in" thereby, under or through the lines, by the phenomena of electro-chemistry. The problem may be summed up in two words, viz., *coating* and *biting* at the same time.

The effect produced may be described as follows:—When the steel plate (with the drawing or transfer in greasy ink on its surface) is plunged into the acid solution of sulphate of copper, those parts of the surface which have not received any portion of the ink are immediately coated with metallic copper. The solution penetrates at the same time by imbibition through the greasy matter of the ink, and reaches the metal beneath, when a voltaic pair (copper and steel) is immediately constituted, the copper already deposited forming the negative pole, and the steel, not yet attacked, being the positive pole. An electro-chemical decomposition of the sulphate of copper then takes place, and at the same time the steel is attacked by the sulphuric and nitric acids. The operation proceeds tranquilly, without any effervescence or disengagement of gas; no other kind of "bitting-in" takes place so calmly. About ten minutes afterwards, the steel plate is withdrawn from the bath, perfectly engraved, and nothing further is required but to remove the copper from the surface by means of ammonia, to render it fit for printing from by the ordinary plate printing process.

One of the most remarkable effects of this process is that all the gradations of an engraving from the highest lights to the deepest shades, are produced at one simple operation, without any artificial "stopping out" whatever; the length of time each part is under the action of the acid being always exactly proportioned to the thickness of the layer of ink at that particular part. For example, when the plate is first placed in the bath, the copper instantly covers and protects from the acid the exposed surface, *i.e.*, the white parts of the engraving; the acid next attacks the finest lines, or those parts where the thinest coating of ink exists, and by the time these lines have been engraved to a sufficient depth, the copper spreading laterally from the edges will have entirely covered and "stopped out" these portions, whilst the broader and deeper lines will resist the deposit of copper (and hence remain exposed to the action of the acid) for a longer time; and so on to the deepest shades, which will remain still longer exposed to the action of the acid, whilst all the lighter parts of the engraving are effectually protected by the copper deposited, so that in fact, each line will be infallibly engraved to a greater or less depth in exact proportion to the thickness of its layer of ink, which is precisely the effect desired. This same phenomenon also prevents the possibility of lateral corrosion, and, on the contrary, causes each line to narrow as it deepens, and to assume, as near as possible, the V-shaped form produced by the cut of the angular point of the graver.

Third Process. The method above described, of acting upon steel plates by sulphate of copper, naturally led me still further, and thus I arrived at my third process, which is merely an extension of the preceding method.

It consists in making an autographic, lithographic, or other transfer on to the steel plate, not by a preparation of turpentine, but by a greasy ink only, or in making a heliographic or photographic drawing or transfer on the same by means of bitumen of Judæa or alkaline bichromates, or in drawing on the steel direct with indian ink, chalk, or black lead pencil; or painting thereon in oil or pastel, or drawing in perchloride of iron or acid; in a word, making a transfer or direct drawing upon the steel plate, with any body or medium capable of resisting the deposit of copper, without opposing the attack of the acid, or with any body capable of depolishing the steel in parts, which will be engraved when the plate is submitted to the action of an acid bath of sulphate of copper.

I may thus generalize my method and extend my particular process of biting on steel to an entirely new kind of engraving, destined, I believe, to take an important rank in this art as a rival to the aquafortis and lithographic processes.

The process is remarkable from the circumstances under which it takes place, and surprising from the results which it yields; for to attack the greasy body, which until now has been a protection to the steel, and to leave the polished surface intact, is exactly the counterpart of any process hitherto known. To preserve to each artist his own peculiar touch and feeling; in a word, to perpetuate his individuality; this is to arrive at the object so earnestly sought, viz., translation without the aid of an interpreter, or, in other words, engraving without the assistance of an engraver.

Proceedings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Society was held on the evening of Wednesday, April 5th, in Myddelton Hall, Mr. W. HISLOP, F.R.A.S., in the chair.

The minutes of a former meeting having been read and confirmed, Mr. Mayland, of Cambridge, and Mr. Angle were elected members of the Society.

The CHAIRMAN informed the members that, in the course of the ensuing summer, an exhibition of arts and manufactures would be held in the North of London, in the Agricultural Hall, the photographic department of which would be placed under the control and management of that Society. There would be an opportunity for a first-class photographic exhibition without risk or expense to the Society. Due notification of particulars would be given, and he hoped that all the members would make some exertion to secure a creditable and worthy result.

Mr. CARTLAND remarked that photography was not to be classified as a fine art in the North London Exhibition.

The CHAIRMAN said that the fine art department was an afterthought, and photography would really have a far better position in the classification it had received.

A couple of maps, copied by Mr. Ross's new doublet lens' were laid on the table. The Chairman called attention to the perfectly straight lines and flat field. In answer to a question, he said these were reduced copies, but he did not know the size of the original.

The CHAIRMAN called attention to a very beautiful specimen of Mr. Simpson's new printing process, collodio-chloride of silver, produced on opal glass, which Mr. Simpson explained had been sent to him by Mr. Swau, of New Castle-on-Tyne.

After some conversation,

Mr. SIMPSON explained, in answer to a question, that he used methylated spirit as a matter of economy. He did not believe that in any case the presence of methyll was injurious in collodion, and for this purpose it undoubtedly was not.

Mr. FOXLEE expressed a similar opinion.

A conversation on the production of doubles and on the absence of any appearance of joining in the background followed, in which Messrs. Bockett, Foxlee, Hill, Simpson, the Chairman, and some others took part.

Mr. BOCKETT asked members if they would cut out of waste prints for him the iron spots they met with, as he was making an examination into their nature and cause.

After some desultory conversation on various subjects,

Mr. W. W. KING proposed that the next meeting be made special, to consider the propriety of having a meeting in June and none in September, which was seconded and carried.

Mr. CARTLAND moved a vote of thanks to the officers for last year's services, especially coupling with it the name of Mr. Barnett for his efficient services and constant courtesy as Secretary. This was seconded and carried by acclamation.

Mr. BARNETT expressed the pleasure it afforded him to be of service to the Society.

Mr. ALDIS showed his umbrella camera stand, which we recently described.

After some conversation, the proceedings terminated.

Correspondence.

THE PANTASCOPIC CAMERA.

SIR,—If compelled by request of friends, "Mr. J. R. Johnson" seems wise in noticing "Architecton's" note, he would, perhaps, have seemed wiser had he noticed it in a different manner. A calm re-perusal will show him that he writer had no wish to intervene between him and any intending purchaser; the camera is therein regarded simply as a scientific chattel, and its value weighed, not by putting silver and copper in the opposite scale, but its practical utility to the photographer. "Mr Johnson's" pecuniary interest in the matter was absent from the writer's mind; what benefit there might be to the heliographic art was the leading idea, that was present. Going through all his explanations and opinions, seriatim, does not seem desirable; there they are—whether good or bad or indifferent, *valeant quantum!* A remark, however, on one or two of his points may, perhaps, appear respectful; so much, therefore, I will offer "Mr. J." complains that the angle of 180° was selected as the test: but why complain? Does not his own prospectus boast that the new instrument will embrace not a mere angle of 50°, or of 60°, or of 100°, but the whole horizon? What, in real truth, is this but "Mr. J." standing at his door, and crying, "What do you lack? what do you lack? cameras, lenses, and clockwork:—oh! my friends—Dallmeyer's, Ross, and Harrison's, and Sutton's, are bosh; mine is the real article." So again about the flat plate question;—does not "Mr. J." perceive that his defence is a mere logomachy; it is all very well to say that he has explained his double meaning in letters, and at meetings; let him do so clearly in the next edition of his prospectus, without fear of consequences. His camera has its advantages, and also its disadvantages; the value of the combination being such that, in my opinion, an intending tourist would do well if he could afford it, to take with him the ordinary camera *and* the pantascopic; but if he takes only one, on no account to rely on the latter alone, at least in its present form, but to make the former his sole companion. And now, in taking leave, "Architecton" recommends to "Mr. J.," and through him to all prospectus-makers generally to avoid in such documents all phrases that—

> "——— Palter in a double sense;
> That keep the word of promise to the ear,
> And break it to our hope:"—

and he would also remind him of the danger of overdoing as well as underdoing any work, (especially if it be that of self-applause), which we have in hand. A writer, living in a distant age and country, gives on this subject a caution:—

> "Multa fidem promissa levant, ubi aquo,
> Laudat venalis, qui vult extrudore, merces."

From this, "Mr. J." will perceive that the weakness here alluded to is not especially his, but that the human heart was the same two thousand years ago—beating under the Roman toga, as it is at this day speculating under the broad cloth of a modern Londoner.—Yours, Architecton.

BAD PHOTOGRAPHY NOT GOOD ART.

Sir,—I beg to enclose you an astounding piece of "art criticism" on photography, which I have cut from the *Court Circular*, of the highly appropriate date of the 1st of April.

The paragraph seems to be quoted from the *Reader*. Possibly, if this gentleman wrote less and *read* more, he would not perpetrate such nonsense about a subject of which he is evidently grossly ignorant. It would certainly be "natural" and "consequently agreeable," that the many talented men whom we claim as brethren, should obtain "relief" from any such preposterous criticisms in future. It might be of service to the *Reader* to suggest to him that in the event of his at any time attempting to gain a *knowledge* of photography, he might not only try the effect of "boldly placing the sitter out of focus," but might, for the sake of getting a good general idea of the figure, ask him to take a turn or two round the studio during the exposure. Perhaps the "unpleasing" and "literal" photographers might demur to this proceeding, on the ground that it would convert a sitter into a "Walker."—I am, dear sir, yours truly, Geo. Robert Fitt.

100, *Regent Street, W.*

[The series of pictures eulogized in extravagant terms by the art critic referred to, is chiefly distinguished by the absence of all the mechanical excellence which should characterize good photography—delicacy, brilliancy, definition, good manipulation, &c. There are present some good pictorial qualities, but none which require the sacrifice of good photography. We feel it important for the credit of our art to protest against the notion that good art is best secured by bad photography.—Ed.]

PHOTOGRAPHIC EXHIBITION.

Sir,—Will you oblige me with a small space in your columns to suggest to the hanging committee of the above exhibition, the propriety of *grouping* the pictures of each exhibitor instead of scattering them over the walls. It appears to me that this system would be more agreeable to exhibitors, and produce a better effect than the one adopted last year.—I remain, sir, your obedient servant, D. H. Macfarlane.

April 11th, 1865.

Talk in the Studio.

Amateur Photographers' Field Club.—The first meeting of this club was held on Saturday last, the members meeting at Burnham Beeches near Maidenhead. The number present was not so large as had been anticipated, some misunderstanding, we believe, prevailing as to the trains. Tannin plates, Fothergill, Dr. Hill Norris's gelatine, and collodio-albumen processes were all represented, and the day being bright and calm we have no doubt that some fine pictures were obtained as the results of a very delightful day's ramble.

The Invention of Vignette Glasses.—In reference to a query in our last Mr. Werge confirms our statement that they were first introduced by Mr. Forrest. He says:—"I know the first vignetting glasses were brought out by Mr. Forrest of Liverpool, as near as I can remember, in 1856 or 7, but they were then *black* and burnt into the glass, not worked *out* of the yellow *flashed* glass, as now. I also think that Mr. Forrest introduced the *flashed* vignetting glasses, but am not quite sure."

Collodion Printing.—Caution.—We find it desirable to offer a word of caution to those of our readers who may be experimenting with collodion printing, whether by the Wothlytype or our own process. It is of the utmost importance that the collodionized paper be thoroughly dried before placing in contact with the negative, or it may dissolve the varnish and spoil the negative. This is of special importance in using a piece of paper smaller than the negative, in which case it may easily happen that the thickened collodion at the end from which it is drained, is not quite dry, and a piece of the negative film may be torn up with it. We have known one or two such cases happen.

Soiree.—The Photographic Society of London will hold a soiree in the rooms of the Architectural Society, Conduit Street, Regent Street, on the 8th of May.

New Wide Angle Lens.—Mr. Dallmeyer described his new landscape lens, including an angle of 90°, at the Photographic Society, on Tuesday night, and exhibited some negatives on 10 by 8 plates taken, with a lens of 6 8-10ths focus. It is a single combination of the general form of the ordinary view lens, consisting of three cemented lenses, two of crown and one of flint glass. The results seemed very satisfactory. Full particulars in our next.

New Printing Process.—Mr. Willis read a paper on a new printing process at the Photographic Society on Tuesday night, and exhibited many specimens. It is based upon the action of chromic acid on salts of aniline, and is very simple and efficient. Details in our next.

To Correspondents.

L. A. D.—Your questions do not trespass on our time, but you have not furnished us with sufficient data to give you an answer. You do not state the kind of dry plates, nor by whom prepared; and you say that, after soaking them a quarter of an hour in water no image appeared; but you do not say whether you developed them, and how. Besides, if all the rest were right, unless it were a bright day, five minutes might be altogether insufficient exposure. Let us know further particulars, and perhaps we can help you.

Cameo.—The copying companies to which you refer, doubtless, are doing a great injury to photography, but we do not know of any means of preventing them. 2. We do not anticipate any chance of sitters being taken at the same ratio. 3. A glass house, properly constructed, may, with glass at top and one side only, give first-class pictures. The side light would be best facing north. 4. Of those you name, X.

Vincent.—Camera printing on opal glass presents, of course, all the especial difficulties of printing by development, which require especial experience to deal with. To succeed well, a very clean, bright negative is necessary to commence with. The bath should be somewhat acid, the collodion contain free iodine, the developer somewhat weak and with plenty of acid, and everything be working very clean and free from fog. A slight under-exposure will be found best for giving pictures which are to be viewed by reflected light; the same picture, which is good as a transparency, will rarely be good as a picture by reflected light. The plan of clearing negatives, where a slight deposit is present on the shadows, described by Mr. Osborn, and published in our Year Book for 1864, would probably be found useful sometimes here. 2. In using our collodio-chloride, for printing on opal glass, a very thin film of organic matter should be applied to the glass first—we have not determined what is best, but gelatine, albumen, &c., are available. We have obtained good results from an attenuated film of raisin syrup, applied and dried before using the collodio-chloride. Where the free nitrate crystallizes in drying, there is either excess, or the collodion is too thin to form a film which holds it properly. Printing by super-position on opal glass has the drawback of not permitting the progress of printing to be examined; some idea may be obtained by looking through. 3. The presence of that roundness and texture in the face to which you refer, is due to several things: primarily, careful and suitable lighting; next, skilful development and intensifying. All the texture might be destroyed by over-intensifying. The quality of the lens affects the matter somewhat, but in less degree than lighting and development. A well-lit face, fully exposed, and not over intensified, ought always to present that texture and modelling you admire.

"Solutions Mixed."—You may keep a 10-grain solution of carbonate of soda always ready mixed for use. 2. A cyanide solution of 10 grains to the ounce, mixed ready, but not having been used. 3. A freshly-mixed iron developer is generally a little more energetic than one which has been made some time, and requires a little more acid. We do not object to one made some time. We often make a concentrated solution with half the proper amount of acid, and keep it for months, diluting for use, and adding acid as we require it. 4. Dilute nitric acid, for the bath, may be kept ready for use.

A Novice is puzzled that, on entering the studio of a professional photographer, he is always ready to produce a good negative, provided there be any light, whilst in his own case the utmost uncertainty prevails, and he never knows whether he shall have fog, or stains, or streaks, or what not. The reason is simply this, that photography is a skilled art, and requires the constant exercise of watchful intelligence, in order to succeed. If a professional photographer, for instance, find things not working satisfactorily, he knows from the nature of the defects, and the history of the things in hand, where the probable source of the evil is to be found. A novice can scarcely know all this at the commencement of his career, and it is only as he gathers experience by practice and observation, that he will be able to command general success. As a rule, the materials which have worked well one day will work well next, provided that they have been kept properly in the mean time. We can give no general remedy for the general uncertainty and misfortune which our correspondent describes, except care and precision. Collodion of a deep red colour is somewhat suspicious, and is probably decomposed, but not necessarily so; the working is the sure test; if it is very insensitive, it is decomposed, in which case there is no absolute remedy; it may, however, be worked off by mixing with a new sample. If collodion is so thick that the plate cannot be covered evenly with it, it may be thinned with ether, or with a thin collodion. If cyanide, which has been used over and over, be used to fix a collodion picture in a strong light, it will often stain the picture from the action of light on the cyanide of silver. A common gallipot will not serve as a crucible. It would probably crack and waste your silver.

Albumen.—The chief trade secret in albumenizing paper is manipular skill; but still there are other conditions necessary to success. Yours is by no means an uncommon difficulty; but, as you state, you cannot find any printed instructions for the mode of getting over it, and that for the simple reason that there is no special mode of meeting the difficulty. The first important thing consists in the very perfect beating of the albumen, and in many instances it is kept a few days to increase its limpidity. We do not think that additions of acetic acid, alcohol, &c., which have often been recommended, either necessary or desirable. A very common source of streaks and irregular drying is the quality of the paper itself, which, if new, is very difficult to manage indeed; the size becomes partially softened, and, mingling with the albumen, causes streaks. The only mode of meeting such a difficulty, is to float very quickly, doing little more than drawing the paper across the albumen; this is, indeed, best in all cases. In using quarter sheets, it is very important that the paper be cut up very smoothly, as if a jagged edge be left to the paper, the little points of paper take up an extra amount of albumen, and then streaks often run from them. We have seen professional albumenizers at work, but have not had much practical experience in albumenizing during the last dozen years. In the early days of albumenized paper, photographers prepared their own, and we did ours; we did not then find much difficulty, but it was not customary at that time to use undiluted white of egg. If any of our correspondents can give "Albumen" any hints we shall be glad

Y. B. H.—The fault is not in your bath, which appears in good working condition, but in the collodion; a little more bromide will cause the comets to disappear. Dissolve 8 grains of bromide of cadmium in an ounce of alcohol, and add from 15 to 20 drops to an ounce of the collodion, or, should that not be sufficient, a little more. The collodion is good, but will work free from comets with a little more bromide. 2. We have had no experience with the lenses you name. 3. You had better have the side light from the east than from the south, and have no front light.

A French Reader.—You do not state in what manner your negatives were injured by the varnish. We believe alcohol is the solvent of the varnish in question, and it is sometimes possible by soaking the film in alcohol to get rid of the varnish; but is difficult to remove it entirely.

C. B. P.—The "mistiness" of which you complain in your pictures is simply want of sharpness. This may arise either from the fault of the lens, from ground glass and sensitive plate not occupying exactly the same position; or from bad focussing. If the fault arise from either of the two latter causes, the image will, when properly focussed, appear sharp on the ground glass. If the lens be faulty, then the image will be as indistinct on the ground glass as it is in the print. If the image be sharp on the ground glass and not in the picture, measure the distance from the front of the camera to the ground glass very carefully, then remove the ground glass and place the dark slide with a plate in it in its place, and lifting up the shutter measure again. Of course the distance ought to be the same. Should this be all right, and the image appear sharp and the negative still wanting in sharpness, it may be that the lens does not "work to focus," that is, the visual and actinic foci do not coincide. If this be the case, you must either allow for the difference in focussing, or get another lens. Chemically your pictures are all right.

C. O. P.—So far as we understand Mr. Helsch's description, he does work the toning bath of chlorides of gold and calcium until it is exhausted. There can be no reason for the prints having less richness when the bath is old, that we can see, except poverty of gold. Our reason for preferring a little chloride of lime in a bath is that it then keeps well without being rendered acid, the very slight trace of free chlorine preventing the gold from being precipitated. 2. The fringes and crape-lines of which you speak are generally due to inferior collodion, but they may arise from good collodion, with careless manipulation. Try some other samples of collodion.

F. W.—The advantage of alkaline development is, that it will assist in bringing out the image in an under-exposed plate, or will permit dry plates to be used with short exposure. It is chiefly used in the tannin process, but we have used it successfully in conjunction with plain pyrogallic acid solution, to get an image in a collodio-albumen plate. Care is necessary in using it to avoid fog. We agree with you as to the excellence and certainty of the collodio-albumen process. The stereographs you forward are excellent. There is nothing better than the acetate bath for landscapes, where a rich purple-brown tint is desired.

E. Aldis.—We shall be glad to see the improvements in the camera and stand.

C. G. Beverley.—If you had sent us a specimen of your failure, we might better have judged of the cause. It is certain that if you worked the process exactly as described, you would have succeeded in obtaining good results, as the prints we have seen produced by it are excellent. State in detail your operations, and let us see a specimen of the failure, and we can, perhaps, make some suggestion. We regret that we have not time to write private letters on difficulties of this kind.

Joseph Webster.—Thanks for the specimens of our process; they are very good, but a little browner in tone than some persons like. We have occasionally noticed the small metallic-looking spots, but have not yet determined the cause. If a very horny collodion be used, we find a considerable tendency to curl whilst toning, &c., but this is not the case where the collodion is of the more powdery, and less contractile character. We shall be glad to hear of your further progress.

S. G. Payne.—We will refer to the groups duly received in our next.

A de Latcua.—We do not know Mr. Rangel's present address, his copy of the News not being supplied direct from the publishing office.

W. C. J.—Your plan is generally good, and aspect also, provided you have an uninterrupted expanse of light. Common glass will do very well. We should prefer an equal amount of glass at each side. A series of blinds will be necessary for top and west side. We do not know of any method of giving a tint of Cathedral green to glass, but should think it possible by the use of varnish, with a suitable oil colour added.

G. G.—The stains arise from the action of the mercury on the excited paper. A negative, intensified with a salt of mercury, must always be varnished before printing. 2. The vignetting is too formal; it rarely happens that the vignette glasses will give a satisfactory result without supplementing with cotton wool, or something of the kind, to break the regular oval form. Your background is too dark for a vignette, and makes the teansition from the dark background to white paper too abrupt.

Several Letters and Correspondents in our next.

Photographs Registered during the Past Week.

Mr. James Russall, Midhurst,
Photograph of Dunford House and Mr. Cobden's Family.

Mr. S. G. Payne, Aylesbury,
Three Photographs entitled "Physician heal Thyself."
Photograph of Sir Anthony Rothschild and Group.

Messrs. Caamb, Brothers, Glasgow,
Two Portraits of a Gentleman.

Mr. William Cuaaey, Bolton,
Two Portraits of Mr H. Vincent.

Messrs. W. & D. Downey, Newcastle,
Two Portraits of late Duke of Northumberland,
Portrait of Rev. J. C. Street,
Two Portraits of Rev. W. Holland,
Three Photographs of Views of Alnwick Castle, interiors.

THE PHOTOGRAPHIC NEWS.

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WEAK PRINTING BATHS WITH ORGANIC MATTER.

Our attention was recently called to some card portraits and examples of a new design in cameo portraits, styled "Quinque Gems," by Mr. John E. Palmer, of Stonehouse, in connection with which we were informed that notwithstanding the great brilliancy of the prints, a silver bath of a strength not exceeding twenty grains to the ounce was employed in producing them. But the speciality of this bath consisted in the use of organic matter—gelatine and sugar—as well as nitrate of silver. Mr. Palmer kindly sent us some of the prepared solution to try, and promised to forward details of his operations for the benefit of our readers.

The solution forwarded to us for trial was a portion of the bath in regular use, made originally of a strength of twenty grains to the ounce, but which Mr. Palmer had found to have fallen to fourteen grains to the ounce. We tried it with two or three samples of ordinary commercial albumenized paper, not prepared especially for use with weak baths. It printed rapidly, and with great vigour and richness, toning very readily to an agreeable purple brown or black, and losing little in toning or fixing. Better results could not have been desired, nor could a sixty or eighty grain bath have produced more satisfactory prints. It is, of course, quite clear that with a strongly salted paper, a long floating on such a weak bath will be necessary, and that a sufficient nitrate must be decomposed to form the chloride of silver: there must also be some free nitrate present to produce the requisite printing conditions. It seems probable, however, that the presence of the gelatine and sugar aids materially in keeping the image on the surface of the paper, and that the organic matter may form a combination with the silver, which may aid in giving sensitiveness and vigour. What is singular in connection with this part of the subject, is the fact that the bath does not readily discolour. Mr. Palmer speaks of its continued use on a commercial scale, without any tendency to turn brown. The bottle sent to us stood some days in the light without any discolouration, and has continued so after use. Organic compounds of silver are generally very sensitive to light, very prone in time to decompose spontaneously. In our experiments with the collodio-chloride of silver process, we attempted to decompose the nitrate of silver with a salt having an organic base, using hydro-chlorate of morphia. It promised to answer admirably; but in the course of a few hours, the whole was decomposed, and blackened spontaneously. In Mr. Palmer's solution, the organic matter appears to have no such effect, a circumstance it will be interesting to trace to its cause. The economy and excellent results of the bath are strong recommendations and render it well worthy of extended trial. We subjoin some extracts from Mr. Palmer's letter detailing his mode of preparing and using the bath:—

> We will begin as though we had all the ingredients at our side: boiling water gone cold, 80 ounces, nitrate of silver 1600 grains, liquor ammoniæ fort. one drachm; shake up all well together. This bath being alkaline gives power to the silver to seize on and appropriate to itself the organic matter, which prepare as follows: take, say, half an ounce of "Nelson's" gelatine, soak in a little more water than it will take up for two hours, then liquidise over a slow fire, or in boiling water which is best. Add a little at a time to the silver solution, between each addition shake well and long to get it well mixed, cease after adding about two-thirds of the quantity. Now take boiling water and pour on one ounce of loaf sugar, dissolve and add two-thirds, thoroughly shake it, and if you like, (as we have done), place it by the fire or use hot water from the commencement, as the gelatine mixes better that way. Put all away for one week, perhaps two weeks, as there is during that time a necessary chemical action between the silver and organic matter. If you find after this period a difficulty in filtering the solution, it is because of too much gelatine; this is easily remedied by adding a little of a 20 grain silver solution to bring it to flow properly. It should just be in that condition which will flow through the filter without trouble, although in winter we have had to warm to dissolve the bath for use. The older this bath the better we find it.
>
> Use best Saxe paper; float from two to three minutes; drain off, and dry the paper before a good fire immediately, horn dry, or you will get it to turn colour. Then fume for ten minutes. The plan we adopt is to make a plate hot, and place it in the bottom of the fuming box, (something after the style described in the Photographic News with strings), pour on two teaspoonfuls of the strongest solution of ammonia on the hot plate, and shut down an end of the box. Be careful when you take out the paper from the box to keep it out of the light, as it is exceedingly sensitive. If the paper prints too blue or slaty, fume less; if that does not correct it add a little more sugar. If any persons try the foregoing and cannot fulfil all it professes, we will prepare any quantity of bath for anyone and guarantee good results.
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> I will try by experiment to form an exact formula, but think I shall be obliged to go greatly by observation, as the organic matter is not always in the same condition, hence the necessity of experience.

Mr. Palmer forwarded to us some very pleasing pictures untoned and unfixed, that we might see the character the prints assumed in the pressure frame. They were of a rich deep coppery brown, not much over-printed. Although a few days old, and a little discoloured in the lights, on being submitted to a toning bath, which had been made and used for some weeks, the formula being one grain of chloride of gold, one grain of chloride of lime, and 6 ounces of water, they toned to a rich warm sepia, in a few minutes, and to a purple brown, or a deep neutral black in a few minutes more; losing, as we have said, little in depth by toning and fixing. Paper prepared by ourselves with the bath gave similar results. Without fuming, the prints were vigorous and good; but a greater richness was obtained by fuming. Altogether the results are such as enable us to recommend the bath for further trial by our readers.

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MEDALS AT THE SCOTTISH EXHIBITION.

Our readers will be interested in the report of the Prize Committee of the Photographic Society of Scotland, which, together with the excellent remarks of Professor Moir on this subject, appear in the Society's Journal.

The Committee appointed by the Council of the Society to select the photographs for which medals were to be awarded, had little difficulty as to the first medal—that for portraiture.

The beautiful picture by Mr. H. P. Robinson of London, titled "Brenda," so artistic in its arrangement, and so perfect in its photographic manipulation, was at once selected as the prize portrait.

This selection was all the more creditable to Mr. Robinson, as there were many portraits of high quality on the walls; amongst which, the productions of Messrs. Nelson, Dallas, Moffat, M'Glashan and Walker, Horsburgh, and Dr. Adamson, may be mentioned; and in this department the Committee would desire to make honourable mention, as regards their grouping and arrangement, of some of the highly artistic picture portraits by Mrs. Cameron of the Isle of Wight.

In Landscape-photography the exhibition was particularly rich; indeed, on no previous occasion had such a noble collection of views been gathered together. Yet, even in the midst of this profusion, there was no difficulty in selecting the prize picture.

There was a difference of opinion as to the particular view to be selected, but all were agreed that to one of Mr. Mudd's pictures the medal must be awarded.

The majority selected "Dunham Park, Cheshire," as the most perfect of those exhibited by Mr. Mudd; and it is worthy of remark that this, which was one of the largest as well as, in the opinion of the Committee, the finest landscape in the room, was produced by a dry process, namely Collodio-albumen.

Amongst the many creditable landscapes exhibited, the Committee would particularly desire to mention those by Messrs. Vernon Heath, Annan, W. D. Clark, Jabez Hughes, Stephen Thomson, Nicol, Kirkland, Herries, Morgan, and Murray.

The third medal, that for the "Best View taken by an Amateur by any Process," was awarded to Mr. John Smith, Darnick Tower, Melrose.

There was considerable difficulty in selecting the picture for this medal, but, upon the whole, the Committee thought that Mr. Smith's beautiful and artistic little picture, "On the Leader Water, near Melrose," was the most perfect picture by an amateur.

The other competitors for this medal were, The Reverend D. T. K. Drummond, Messrs. John Clerk, Nicol, Brownrigg, L'Amy, and Herries.

"For the best View in Scotland," the Committee had much pleasure in awarding the medal to Mr. Thomas Annan, of Glasgow, for his large and very perfect view of "Dumbarton Castle." Mr. Annan had several pictures of nearly equal merit, all of a large size.

Mr. W. D. Clark exhibited a great number of charming views in Scotland; but although equally perfect in their photography and in their artistic arrangement, they were not equal in size to those by Mr. Annan, and therefore, as presenting less difficulty in their production, they did not appear to the Committee to be so worthy of the honorary distinction as those of Mr. Annan. The other views in this section were by Messrs. Hunter, Drummond, Kirkland, Beldon, Crombie, Smith, Campbell, Murray, Nicol, Neilson Crow, Peat, Ewing, and Musgrave.

The Medal for "The Best Group" was awarded to Mr. J. Ramsay L'Amy, of Dunkenny, for an excellently-arranged picture containing sixteen figures. The other groups were by Messrs. Tunny, Annan, Good, C. Smith, Campbell, Dallas, and Mrs. Cameron.

The Council had reserved the power of awarding extra medals for any work of merit not included in the above list, and they have given a medal to the Pantascopic Company, for the very beautiful panoramic pictures produced by their ingeniously constructed pantascopic camera.

Another extra medal was awarded to Mr. Samuel Highley of London, for his admirable microscopic slides for the magic lantern.

At a recent meeting, the Society had an opportunity of witnessing the effect produced by those slides when enlarged by the lantern and oxhydrogen light.

In name of Prize Committee—T. B. Johnston, *Hon. Sec.*

Professor Moir said,—I find myself in the position of representing our distinguished President, Sir David Brewster, who, although he has given us his presence on every possible occasion, is unfortunately absent this evening. On me, therefore, devolves the duty of presenting the prizes which have been awarded by the Council. I am afraid that, in most cases, they must be received by proxy, and that we must ask our Secretary, Mr. Johnston, to transmit them to many of the gentlemen who have been selected to receive them. It has been a subject of great satisfaction to the Council and all concerned, to know that the prizes they proposed to award have all been given to competitors who well deserve them. The only regret the Committee had was, that they had not had more prizes to give; for, looking round the walls of the last Exhibition, I must say there were a great many pictures of every kind for which, if we had had more in our power, we would have been delighted to give additional prizes. The gentlemen to whom we have assigned those we have been able to bestow are already in most instances well known to the Society. The first prize was, without any doubt or hesitation, given to a gentleman who, we are proud to think, has been associated with us from the commencement of the Society. At every exhibition we have had, he has been a distinguished contributor, and he has already gained six of our prizes. He has taken four prizes for what are called composite pictures, some of them of distinguished excellence, such as the "Bringing Home the May," with which you must all of you, who are photographers, be perfectly conversant. He has also gained a prize for his *cartes de visite*, and another for a most beautiful landscape. He now comes forward to take the first prize in pure and simple portraiture; and I would say that the last picture he has now exhibited, called "Brenda," is, to my mind, more completely satisfactory than all the composition pictures which Mr. Robinson has ever yet displayed. It is to my mind a perfect portrait, as complete in pose, in manipulation, and in light and shade as anything I can conceive of. We now come to another gentleman, with whose works we are also familiar, who has also contributed largely to our exhibitions, and taken our prizes—Mr. Mudd. On former occasions we have awarded him two prizes in our competitions. On the present occasion, the competition was not between Mr. Mudd and any other person, but between Mr. Mudd and himself. The difficulty we had was not who should get the first prize, but which of Mr. Mudd's productions we should select for the prize. On that point, as the report tells you, we had some little difference of opinion. Some of us were inclined to prefer a most admirable photograph of an old, decayed and almost blasted tree; others said that, while the picture before you (Dunham Park) possessed all the photographic merit of the other, it was the more pleasing subject; and accordingly it was preferred. The third gentleman on our list is one who, I regret, did not on former occasions receive our prize. He was always very near it, but, by some unfortunate circumstance, somebody always happened to get ahead. I have now great satisfaction and pleasure in announcing that the Council has awarded to Mr. Annan the prize for the best landscape in Scotland. I remember very well seeing a picture of his some years ago, which appeared to me to be of very high character, and which I felt sure was an index to his future advancement. I think it was called "The Last Stocks of Harvest," or some such name. It was exhibited here, and afterwards in London, where it was very highly admired. I felt sure, on seeing that picture, that Mr. Annan would not be long in gaining our honours, and I am sure we will all be ready to congratulate him on his success on this occasion. The next two gentlemen I have to name are amateurs. It is very flattering to us, and, I hope, agreeable to the professional members, to find that the amateurs are able to take a portion of our prizes. I allude to Mr. Smith and Mr. L'Amy. Mr. Smith has exhibited only a small view, but it is one which possesses highly artistic qualities; and its merits are not at all in proportion to its size. My friend Mr. L'Amy has achieved a great triumph over a difficulty felt by every one who has tried to do what he has done—namely, grouping a large number of persons under conditions which shall make the attitudes at once life-like and pleasing. There remain two prizes which are not perhaps strictly or absolutely given for photographs, though they are given in connection with photography. One is the prize we have given to the Pantascopic Company for a new camera, and the other the prize awarded to Mr. Samuel Highley for his slides. It appears that the Pantascopic Company's prize is presented on a somewhat complex view, partly for the beautiful panoramic landscapes, and partly from the ingenuity of the camera by which they are produced, and the additional power of introducing a large angle which the camera professes to give, and which I must admit it does give. At the same time it is right I should say, I do not understand that that camera will be suited to all kinds of architectural portraiture. If you attempt to take the portrait right in front of the object, the inventors admit at once that the camera will not suit: it will give a certain amount of curvature to the view; so that, if the picture were taken directly opposite, it would represent not a straight line, but a curve. But the Company do not claim that it will take architectural portraits absolutely parallel to the object, whereas, taking a certain angle, it will do very well. I think it right to say that I have ordered one of these cameras, and found it to accomplish what it really professes to do. Mr. Highley's slides I had not the opportunity of seeing, but from what I have heard of them they appear to be very admirable. I think that in making these two extra prizes, we have not gone beyond our powers; and in asking Mr. Johnston to send the prizes to those gentlemen who are not present, I have to request him, in your name, to add the thanks of the Society, and, shall I say, our sincere gratitude for favours to come.

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PICTURES OF THE ST. LAWRENCE.

Taken in Autumn.

BY J. WERGE.[*]

"All aboard," and away we go again as fast as steam and a strong current can take us, passing an Island here and there, a town or a village half French and English, with a sprinkling of the Indian tribes, on the banks of the river now and then. But by this time it is necessary to go below again and dine. Bed, board, and travelling are all included in the fare, so everyone goes to dinner. There is, however, so much to see during this delightful trip, that nobody likes to be below any longer than can be avoided. Immediately after dinner all are on deck again, anxious to see all that is to be seen on this magnificent river. The sights are various and highly interesting to the mind or "objectives" of either artist or photographer. Perhaps one of the most novel subjects for the camera and a day's photographing would be "Life on a Raft," as you see them drifting down the St. Lawrence. There is an immense raft—a long, low, flat, floating island, studded with twenty or thirty sails, and half a dozen huts, peopled with men, women, and children, the little ones playing about as if they were on a "plank road," or in a garden. It is "washing day," and the clean clothes are drying in the sun and breeze—indicative of the strictest domestic economy and scrupulous cleanliness of those little huts, the many-coloured garments giving the raft quite a gay appearance, as if it were decked with the "flags of all nations." But what a life of tedious monotony it must be, drifting down the river in this way for hundreds of miles, from the upper part of Lake Ontario to Montreal or Quebec. How they get down the rapids of the St. Lawrence I do not know, but I should think they run considerable risk of being washed off; the raft seems too low in the water, and if not extremely well fastened might part and be broken up. We passed two or three of these rafts, one a very large one, made up of thousands of timbers laid across and across like warp and weft; yet the people seemed happy enough on these "timber islands." We passed them near enough to see their faces and hear their voices, and I regretted I could not "catch their shadows" as we passed, or stop and have an hour or two's work among them with the camera or the pencil; but we passed them by as if they were a fixture in the river, and they gave us a shout of "God speed," as if they did not envy our better pace in the least.

There is abundance of work for the camera at all times of the year on the St. Lawrence; I have seen it in summer and autumn and have attempted to describe some of its attractions. And I was told that when the river—not the rapids—is ice-bound, the banks covered with snow, and the trees clad in icicles, they present a beautiful scene in the sunshine. And in the spring, when the ice is breaking up, and the floes piling high on one another, it is a splendid sight to see them coming down, hurled about and smashed in the rapids, showing that the water in its liquid state is by far the most powerful. But now we are coming to the most exciting part of our voyage. The steam is shut off, the engine motionless, the paddlewheels are still, and we are gliding swiftly and noiselessly down with the current. Yonder speck on the waters is the Indian coming in his canoe to pilot us down the dangerous rapids. We near each other and he can now be seen paddling swiftly, and his canoe shoots like an arrow towards us. Now he is alongside, he leaps lightly on board, his canoe is drawn up after him, and he takes command of the "boat." Everybody on board knows the critical moment is approaching. The passengers gather "forward," the ladies cling to the arms of their natural protectors, conversation is stopped, the countenances of everyone exhibit intense excitement and anxiety, and every eye is "fixed a-head," or oscillating between the pilot and the rushing waters which can now be seen from the prow of the vessel. The Indian and three other men are at the wheel in the "pilot house," holding the helm "steady," and we are rushing down the stream unaided by any other propelling power than the force of the current, at a rate of twenty miles an hour. Now we hear the rushing and plunging sound of the waters, and in a moment the keen eye of the Indian catches sight of the land mark, which is the signal for putting the helm "hard a port," the wheel flies round like lightning, and we are instantly dropped down a perpendicular fall of ten or twelve feet, the vessel careening almost on her "beam ends," in the midst of these wild, white waters, an immense rock or rocky island right ahead. But that is safely "rounded," and we are again in comparatively quiet water. The steam is turned into the cylinders and we go on our course in a sober, sensible, and steamboat-like fashion. When we were safely past the rapids and round the rock, a gentleman remarked to me that "once in a lifetime was enough of that." It was interesting to watch the countenances of the passengers, and mark the difference of expression before and after the passage of the rapids. Before, it was all excitement and anxiety, mingled with a wish-it-was-over sort of look. And all were silent. After, everybody laughed and talked, and seemed delighted at having passed the *Lachine* Rapids in safety, yet most people seem anxious to undergo the excitement and incur the risk and danger of the passage. You can, if you like, leave the boat above Lachine and proceed to Montreal by the cars, but I don't think any of our numerous passengers ever thought of doing such a thing. As long as ever this magnificent water way is free from ice, and the passage can be made, it is done. I don't know that more than one accident has ever occurred, but the risk seems considerable. There is a very great strain on the tiller ropes, and if one of them were to "give out" at that critical time, nothing could save the vessel from being dashed to pieces against the "rock ahead," and scarcely a life could be saved. No one can approach the spot except from above, and then there is no stopping to help others; you must go with the waters, rushing madly down over and among the rocks. The Indians often took these rapids, in their canoes, to descend to the lower part of the St. Lawrence; and one of them undertook to pilot the first steamer down in safety. His effort was successful, and he secured for his tribe (the Iroquois) a charter endowing them with the privileges and emoluments in perpetuity. I wish I could have obtained photographic impressions of these scenes and groups, but the only lens I could draw a "focus" with was the eye, and the only "plate" I had ready for use was the *retina*. However, the impressions obtained on that were so "vigorous and well defined" I can at any moment call them up, like "spirits from the vasty deep," and reproduce them in my mental camera.

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[*] Concluded from p. 172.

The remaining nine miles of the voyage were soon accomplished. Passing the first abutment of the Victoria Bridge, which now crosses the St. Lawrence, at this point two miles wide, we quickly reached the fine quay and canal locks at Montreal where we landed, just as it was growing dark, after a delightful and exciting voyage of about thirty hour's duration, and a distance of more than 400 miles. Quick work! but it must be borne in mind how much our speed was accelerated by the velocity of the current, and that the return voyage, by canal, past the rapids, cannot be performed in anything like the time.

On reaching the quay I parted with my agreeable fellow voyagers, and sought an hotel, where, once more after a long interval, I slept under a roof over which floated the flag which every Englishman is proud of—the Union Jack.

Next morning I rose early and with a photographic eye scanned the city of Montreal. The streets are narrow, but clean, and well built of stone. Most of the suburban streets and villa residences are "frame buildings," but there are many handsome villas of stone about the base of the "mountain." I visited the principal buildings and the Cathedral of Notre Dame. I ascended to the top of the Bell Tower and looked down upon the city, and had a fine view of its splendid quays and magnificent river frontage, and across the country southwards for a great distance, as far as the Adirondack Mountains, where the Hudson River bubbles into existence at Hendrick Spring, whence it creeps and gathers strength as it glides and falls and rushes alternately until it enters the Atlantic below New York, over three hundred miles south of its source. But the mountain at the back of Montreal prevented my seeing anything beyond the city in that direction. I afterwards ascended the mountain, from the summit of which I could see an immense distance up the river, far beyond Lachine, and across the St. Lawrence, and southwards into the "States." Being homeward bound, and having no desire at that time to prolong my stay in the western hemisphere, I did not wait to obtain any photographs of Montreal or the neighbourhood. But taking ship for old England I leave the Lower St. Lawrence and its beauties, Quebec with its glorious associations of Wolfe and the plains of Abraham, its fortifications which are now being so fully described and discussed in the House of Commons, and the Gulf of the St. Lawrence, where vessels have sometimes to be navigated from the "masthead," in consequence of the low-lying sea fog which frequently prevails there. A man is sent up "aloft" where he can see over the fog, which lies like a stratum of white cloud on the gulf, and pilot the ship safely through the fleet of merchantmen which are constantly sailing up and down while the river is open. The fog may not be much above the "maintop," but is so dense it is impossible to see beyond the end of the "bowsprit" from the deck of the ship you are aboard; but from the "masthead" "the look out" can see the high land and the masts and sails of the other ships, and avoid the danger of going "ashore" or coming into collision by crying out to the man at the wheel such sea phrases as "Port," "Starboard," "Steady," &c.; and when "tacking" up or down the gulf, such as "luff," "higher," "let her off." Indeed, the whole trip of the St. Lawrence—from Lake Ontario to the Atlantic, is intensily exciting. While off the coast of Newfoundland, I witnessed one of those beautiful sights of nature in her sternest mood, which I think has yet to be rendered in the camera—icebergs in the sunlight. A great deal has been said about their beauty and colour, but nothing too much. Anyone who saw Church's picture of "The Icebergs," exhibited in London last year, may accept that as a faithful reflection of all their beautiful colours and dreadful desolation. All sailors like to give them as wide a "berth" as possible, and never admire their beauty, but shun them for their treachery. Sometimes their base extends far beyond their perpendicular lines, and many a good ship has struck on the shoal of ice under water, when the captain thought he was far enough away from it. The largest one I saw was above a 100 feet above the water-line, and as they never exhibit more than one-third of their ponderous mass of frozen particles, there would be over 200 feet of it below water, probably shoaling far out in all directions. We had a quick run across the Atlantic, and I landed in Liverpool, in the month of November, amid fog, and smoke, and gloom. What a contrast in the light! Here it was all fog and darkness, and photography impossible. There,—on the other side of the waters—the light is always abundant both in winter and summer; and it is only during a snow or rain storm that our transatlantic brother photographers are brought to a stand still.

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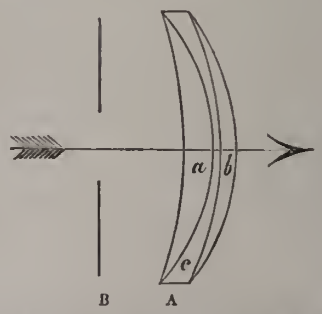
ON A NEW FORM OF LANDSCAPE LENS, INCLUDING A LARGE ANGLE OF VIEW.

BY J. H. DALLMEYER.*

I have to bring before your attention to-night a new landscape lens, including a large angle on a flat plate. It is in form a single combination, consisting of three cemented lenses; two of which are of crown glass, of different qualities, and one, the central lens, of flint glass.

The diagram shows the general form of the lens and mode of achromatization.



a and *b* are both concave meniscus lenses of two different kinds of crown glass; and their focal lengths are in the ratio of 1 to 3. Between the two is situated the concavo-convex flint-glass lens *c*, the adjacent surfaces having the same radii of curvature, and the three lenses cemented together produce an achromatic whole, or nearly so. B is the diaphragm, placed at a distance of ⅓ the diameter, or 1-15th the focal length of the lens in front of *a*. The apertures of the revolving disc forming this diaphragm are certain aliquot parts of the equivalent focal length of A, engraved thereupon.

The lens covers a circle of 92°, defines and equally illuminates with the largest stop (which is 1-15th of the focal length) an angle of 60° on the base-line of a rectangle of the usual proportions employed by photographers, and with the smallest stop (which is 1-30th the focal length) an angle of 80° on the base-line of a similar rectangle.

It produces a minimum of distortion, and gives clean and brilliant pictures free from a central spot or "flare." Other minor advantages might be named, viz. greater portability, for it only occupies about one-half the bulk of the ordinary view lenses; greater durability, for the flint, or softer glass, is protected from injury by the two outer crown-glass lenses of harder material, &c.

Having given a brief description of the instrument, I will now add a few remarks about its origin.

Some eighteen months ago, a gentleman well known among our best amateur photographers, Mr. Russell Manners

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* Read at a meeting of the Photographic Society, April 11, 1865.

Gordon, called upon me with a picture taken by him with a lens of his own contrivance, including an angle of from 78° to 80° on the base-line. The picture was fairly defined throughout, and equally illuminated up to the corners.

Mr. Gordon was so delighted with this new acquisition, enabling him to take views composing pictures which had before been impossible, that he impressed me with the desirability of constructing an instrument capable of embracing so large an angle for photographers generally, and, if possible, to be an improvement upon the one he possessed. The lens referred to was simply one taken by him from a French Opera-glass, consisting of two lenses cemented together, and of about 5 in. focal length. A small stop was placed in front, the aperture and best position of which had been determined by careful experiment on the part of Mr. Gordon; and I gladly bear testimony that no optician could have done it better for the ends in view. Yet it did not satisfy him; and he expressed a desire for something better.

On careful inspection of the very beautiful pictures produced by this lens, kindly lent for illustration this evening, you will be able to detect a considerable amount of curvature of field, notwithstanding the aperture of the stop employed was small, being but 3-16ths of an inch for a focal length of 5 in. The distortion, also, of marginal straight lines is very great.

With these points before me, I devoted the time at my disposal during the following winter months to an investigation of the case, and now present you with the result.

The propositions to be solved are these. Required a lens or combination of lenses. First, to include an angle of from 90° to 100° across the diagonal of the picture. Second, to give a sufficiently flat field of view. Third, to admit for the above angle of the use of the largest possible aperture; the smallest stop not to exceed 1-30th of the focal length of the lens. Fourth, to produce an image free from distortion. Fifth, to work free from "flare," &c., or, in other words, to produce a clear and brilliant picture.

Among the existing view-lenses, namely, the ordinary single combination, the aplanatic, the orthoscopic, the triple achromatic, and the globe, or doublet, the average circle of illumination does not exceed 70° or 75°. The extention required, therefore, to satisfy proposition 1, amounts to about 20°.

To begin with the lenses, *per se*, free from distortion, by construction, such as the triple achromatic, and the globe or doublet lens. It is possible to extend the circle of illumination beyond the usual angle of 70°, either by increasing the diameter of the lenses (of course the front and back combinations of the triple achromatic only), or by decreasing the amount of separation of the lenses forming these combinations; but both these operations run counter to some of the other requirements: for the first is attended by greater astigmation of the marginal pencils, and the second by greater curvature of field, both of which necessitate the use of a smaller stop, to correct the error so introduced. An alteration in the forms of the lenses also, to obtain the required increase of angle, is likewise attended by similar drawbacks.

Now, in the globe, or doublet form of lens, a small diaphragm is necessary to correct the great amount of spherical aberration occasioned by the forms of the lenses employed to produce the required amount of flatness of field. And I believe it to be practically immaterial whether both front and back combinations are of the same form, as in the globe lens, or of different forms, as in the old and the more recent doublets.

It is obvious, therefore, that these lenses, or a modification of them, will not satisfy proposition 3, viz., the smallest stop for an angle of 90°, not to exceed 1-30th of the focal length.

There is also another objectionable feature in the globe, or doublet form of lens, viz., that the front combination, exposed to the view, is as large, in fact, as the back, the surfaces of these glasses acting not only as refractors, but also as reflectors. When using small stops, a "flare," or round spot, in the central portion of the picture is almos invariably the result. My attention was called to thi defect in one of the pictures recently exhibited at the North London Photographic Association, evidently taken with a small stop. I believe, moreover, that there is no remedy for this defect, however carefully the lenses may be mounted.

I may here as well observe, in passing, that my principal reason for making the front combination of my triple achromatic lens smaller in diameter than the back combination, was to avoid this defect. But even in this case, under certain conditions of light, and when the lens is worked with the smallest diaphragm, occasionally the central spot of light makes its appearance, in spite of the most careful mounting of the lenses. In fact, I invariably protect them with dark *annuli* round the edges; my attention having been called to this point by Mr. Wilson, of Aberdeen, a few years ago.

Before I quit this subject, I would impress upon photographers generally, working with double combinations in the field, or even upon interiors, the importance of using no more of their front lenses or combinations than is necessary to fill the required size of plate, if they aim at brilliant results.

This was the experience of one of our ablest photographers, Mr. England, when photographing the interior of the International Exhibition of 1862. He caused me to make for him front stops of different sizes, to slide into the hoods of his No. 1 B lenses; and with a suitable central diaphragm in position, he cut off, by means of these front stops, all unnecessary diameter of the front combinations, retaining only just so much as would cover the required stereo plate; and who has not admired the brilliant stereograms produced by this gentleman?

To return to the subject in hand, I found that neither the triple achromatic, nor the globe, or doublet, were capable of yielding the required result. I next investigated the case of an unsymmetrical doublet, the front combination of smaller diameter than the back, for the reasons above detailed; but this also did not satisfy the requirements, especially as regards rapidity of action, and it was therefore put aside.

Thus I was induced to return to the single combination, since it promised to admit of a larger aperture for the required angle of 90° or 100°, than any of the double or triple combinations above referred to. But here, at the outset, it became necessary to alter proposition 4 to read thus:—Required, a lens producing a *minimum* of distortion, instead of "free from distortion." For in view of the other necessary qualities, I believe that a single combination, the contact surfaces cemented, cannot be made to produce an image entirely free from distortion. Here it may be mentioned that, when aiming to embrace an angle of view measuring, say, from 70° to 80°, on the base line projected upon a flat surface, no matter how perfect the combination, as regards the absence of distortion, *per se*, the resulting picture is in reality imperfect; for the relation of conjugate foci of the central and marginal parts of the picture and object are not the same. It may, in fact, be considered as having been produced by a series of lenses, the focal lengths of which increase from the centre towards the margin, *i. e.*, marginal objects are represented larger than the more central ones—a fact well known to opticians and photographers, which has recently also been referred to by Mr. Sutton.

Now, it fortunately so happens that the kind of distortion produced by a single combination tends in the opposite direction, and thus, to some extent, at least, the above defect is neutralised. The resulting pictures are, to say the least, much more truthful representations of objects than panoramic pictures, taken either on curved plates or by rotating lenses, and then viewed on flat boards.

Once more referring to Mr. Gordon's lens, which, as I have already stated, he had by experiment worked to the best advantage, nothing more could be got out of it by any attempt at alterations.

Now, with a view to the solution of the propositions already stated, I ascertained, first of all, the results obtainable by alterations in the ratio of radii of the existing single combination view lenses, beginning with a plano-convex, and concluding with a deep meniscus externally. To detail to you the results so obtained, even were I to express them in general terms, would, I fear, be uninteresting. The more so, since, after all, it proved unsuccessful; for I found that, by employing two lenses only, no matter how achromatised, the desired object could not be obtained.

I next resolved upon an increase in the expenditure of optical means for the lens required, and in order to gain another element of correction, determined to use three lenses instead of two. The advantages derived from the use of two crown lenses, of different optical quality, for a given combination, amount to, briefly, this—more perfect correction of the chromatic aberration; and the additional surfaces afford another element of correction for the oblique or excentrical pencils. Thus it became possible to bring before you this evening a lens fulfilling the required conditions, and possessing the advantages I have already stated above.

I now leave it with you, to determine by actual practice, whether it proves another acquisition to your stock of useful instruments, still further enabling you to enhance the value and extend the sphere of that beautiful art of which this society has been one of the foremost promoters.

In conclusion, I will only remark that the new lens is not intended to supersede the triple achromatic lens, which, over a limited area of field, for copying architectural subjects, groups, &c., admits of the use of a much larger aperture than the globe or other such compound lenses, and produces clean and bright pictures, but rather to add to the already existing resources of the photographer.

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THE ANILINE PROCESS OF PHOTOGRAPHIC PRINTING.

BY W. WILLIS.*

The few years immediately following the publication of Mr. Fox Talbot's method of photogenic drawing, were remarkable for the number and variety of other photographic processes then discovered. The frequent announcement of new processes, in which both the substances and the manipulation were for the first time introduced into photography, gave to the new art an amount of interest that seems to have left it in the later monotonous years of collodion negatives and albumenized silver prints. It is true that the majority of those early processes were more curious than useful, and they soon fell into neglect. There were, however, among them a few that merited a better fate, and it was then my belief that these would eventually be brought into use. Among the processes alluded to, that known as Hunt's Chromatype has ever been an especial favourite with me. In this process, paper is coated with a solution of bichromate of potash and sulphate of copper, and after exposure to light under a drawing or other object, is immersed in a solution of the nitrate of silver or of mercury; when the picture developes of a bright red colour. Those who have practised this method know how perfectly the half tints are rendered, and how completely the photograph is a transcript of the object laid upon it. It gives, also, a positive by one operation, so that drawings can be copied without requiring the previous production of a negative. But then everything is represented in either a scarlet or orange dress, and although such tints do very well to reproduce the red chalk sketches of the old masters, they are inadmissible in landscapes and ordinary drawings.

Finding that these chromatype copies so perfectly imitate the original, it has long been a subject of interest and of labour to me, to discover a method of altering their tint to some shade of brown or black, so as to make them more nearly resemble ordinary photographs, prints, or drawings.

My earliest attempts were confined to the treatment of the silver-developed chromatype; to the changing its scarlet hue to a black one. The trials made for this end we almost innumerable, and extended over many years of occasional experimenting, in which, however, an interval of several months would sometimes occur between two successive experiments. It would be tedious and useless to describe the various methods adopted; a few of the most successful may, however, prove interesting. The conversion of the chromate of silver into a chloride, and its subsequent exposure to light, as first proposed by Mr. Hunt, was found to give a variety of purple and slaty tints. Immersing the picture in a solution of an alkaline sulphide changed it to a pleasing brown; but the best dark tint was obtained by placing the scarlet picture in a solution of a neutral alkaline tartrate, which whitened it, and, after drying, and exposure to light, changed it to a fine vandyke-brown. One of the most curious methods adopted for darkening the paper was that of holding them before a fire, till the paper was almost scorched; when they changed to black, owing to the partial reduction of the oxides of chromium and silver. These were found to change, after long keeping to a green colour, probably from the conversion of the oxide of silver to a sulphate, and consequent isolation of the green oxide of chromium.

The difficulty of keeping the ground of the paper clear in these chromatypes (owing to the tenacity with which the silver salt used in their development, retains its hold of the paper), caused me, finally, to abandon any further attempts to get dark coloured pictures from silver-developed chromatypes, and to direct my efforts to the discovery of a substance that would develop the picture of a dark colour when applied, instead of silver, immediately after the exposure to light. My best results in this direction were obtained by the use of the various forms of tannic acid, such as infusions of sumach, valonia, nut-galls and catechu. The last-named gave very rich brown, and catechine very rich sienna tints. Hematoxylin, the colouring principle of logwood, gave the darkest colour; but in all these cases the ground of the picture was much discoloured, and the picture smeary, owing to the solubility of the unreduced chromic salt, in the coloured infusion.

When just on the point of giving up these researches as hopeless of successful result, my attention was arrested by the following passage in a modern work on chemistry—"Chromic acid strikes a green, a blue or a black colour with the salts of aniline, according to the degree of concentration of the solutions." It immediately occurred to me, that since, in a chromatype picture, just after its exposure to light, the picture itself contains free or uncombined chromic acid, whilst the ground of the picture consists only of chromic oxide; if such picture were immersed in a solution of a salt of aniline it would be blackened where the chromic acid lay, and probably not on the other parts. A salt of aniline was accordingly prepared, and on immersing a chromatype picture therein, the design changed to a fine purplish-black colour. The ground of the paper, however, was discoloured, and the design itself smeary, as in the tannin-developed pictures. This defect was partially overcome by dexterously covering the paper by a single stroke of a flat brush, leaving only a sufficient of the aniline salt to slightly moisten the surface. The citrate of aniline was found to give the best results. In order to discover if any improvement could be effected by varying the nature of the solution used for coating the paper, an old variety of the chromatype solution, consisting of the chromate of copper dissolved in sulphuric acid was prepared, and better results seemed to follow from its use. This variety of the chromatype solution, proposed first, I believe, by Hallem, led to some important discoveries in connection with this subject. It soon became evident that a great change of tint resulted from the varying quantities of free sulphuric acid which unavoidably attended such a method of preparing the sensitizing solution. With excess of the acid bright green pictures were obtained, an unexpected and interesting result, as I had not until then heard of the production of green photographs. I next began to reason that the free sulphuric acid in the sensitising solution might be made to form the requisite salt of aniline, and thus save the necessity for the previous preparation of such salt; but as aniline in its concentrated form could not be applied to the picture without spoiling it, solutions of aniline in benzole, in ether, and in alcohol were made, and the exposed pictures immersed therein. The result was as anticipated, the requisite salt of aniline was formed, and the picture developed. On removing it from the solution, and hanging it up to dry, the benzole and excess of aniline evaporated. I expected by this means to be able to get pictures free from the smeariness that results from the use of aqueous salts of aniline, the chromic salts not being soluble in benzole. In this I succeeded, but the excess of aniline left the paper much discoloured; this method was therefore abandoned, and a return made to the citrate of aniline development. I was acquiring considerable dexterity in the application of this citrate solution by one stroke of the brush, when an accident occurred that altered entirely the mode of applying the developer. (This accident will be seen to bear much resemblance to the well-known one that happened to Mr. Fox Talbot, in connection with the Calotype process). A picture which had been quickly but only partially covered with the developing liquid was placed in a drawer to allow of its development in the dark; on taking it out again an hour afterwards, it was found to be developed much beyond the limit of the wetted portion. This was at the first glance puzzling, as it was impossible that the liquid salt of aniline could have penetrated so far by capillary action. A few moments' reflection sufficed to point out the real cause—that vapour had escaped from the wetted portion and had coloured the dry parts. A trial was of course immediately made to develop a picture by vapour alone. The bottom of a cylindrical glass jar was covered with a solution of citrate of aniline and a chromatype picture was suspended over it. In a few minutes afterwards the picture was found to be completely developed, and that in a very superior manner. The lights of the picture were very clear and bright, whilst the design had no trace of smeariness. The latter result was to be expected, seeing that the sensitizing salts had not been brought into a state of solution.

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* Read at the Photographic Society, April 11th.

The first experiment sufficiently established the superiority of this method of development, and for some time I continued to suspend pictures horizontally over the surface of a solution of citrate of aniline. It is surprising that sufficient aniline should escape from such a solution, especially when it contains, as it ought, a large excess of citric acid. When pure aniline was spread over the bottom of a glass dish and a picture suspended over it, the lights were always much discoloured. The aqueous acid citrate of aniline was therefore persevered with, until a dilute solution of aniline in benzole, turpentine, or ether was found to be preferable, owing to the absence of water, which, even in vapour, seemed sometimes to blurr the picture. The method of using this solution of aniline in benzole was as follows:—A shallow box or tray of the size of the largest sheets used, had two or three sheets of bibulous paper placed on its bottom, and the solution of aniline was then poured on these sheets by means of a dropping-bottle in lines or rows of liquid about two inches apart. The sheet to be developed was attached by drawing pins to the under side of a loose cover, which was then placed on the tray and rested on the broad and flatly-planed sides of the box. The vapours of aniline and benzole then ascended and coloured all the parts of the picture which had not been reduced by light. Latterly it has been my custom to reverse the position of the picture and the bibulous paper, making the latter a fixture to the under side of the cover, and simply laying the picture face uppermost on the bottom of the box.

(To be continued.)

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ABOUT LIGHT, AND ABOUT LIGHTING THE SITTER;

With some Reflections about the Room in which he is Lighted.

BY JABEZ HUGHES.*

Light is verily the Alpha and the Omega of the photographer, yet it has received less special study than any of the agencies he employs. Hitherto our energies have been directed to the understanding and perfecting our processes—in securing good tools and proper materials, but having attained considerable success in these directions, it should now be our purpose to study how best to use the power we have obtained. We have conquered mechanics, controlled chemistry, subsidised optics, and now we should attack Old Sol himself, and seize him by the beams, as a lion by his beard, and so assume the mastery. Light is very much as the proverb says of Fire—a good servant but a bad master. One must not let it have its own way; it must be governed, ruled, controlled, held in check. The Sun is far too liberal with his power; he darts his rays just as freely in the wrong as in the right direction, and is as ready to spoil as to make a picture. It is for the photographer to use and not abuse this prodigality. And this leads to the question of questions, how to use the light.

The subject is too great to treat in all its bearings, and I shall confine myself to portraiture.

To say, however, that the subject—the best method of lighting the sitter—has not received attention, is not correct, for no one theme has been so much dilated on for the last two or three years. It is a subject that seems in the minds of all. Now we have a communication in the metropolis, next it is from the provinces; this week it comes from Germany, last week from America, and so on. The constancy of the subject, as well as the many differently devised glass rooms, show that we have not mastered the subject, for we do not go on discussing that which we understand. I am afraid we are not likely to make the same rapid progress in this as most other branches of photographic enquiry, purely from the intangible nature of the subject. In the mechanical, optical, and chemical branches, we have, by persevering experience, worked our photographic operations into a sort of rut; we have hedged them in with formulæ, and if a person of average ability only keeps within these boundaries, he is sure of moderate success. In mechanics, we have our plates and papers of certain sizes; in optics, our lenses of known diameters and lengths of focus; in chemistry, our solutions of definite strengths; all these are sufficiently universal and constant for daily use, so that we can compare our experiences. But when we come to speak of light, we are deficient in data. We cannot say, take forty square feet of glass in the roof, and the same number at the side, and place a sitter within six feet from these windows, and a certain result will be produced. There are a thousand modifying conditions to be considered,—the aspect of the windows, the time of the day, the period of the year, the quality of the light; whether in town or country, on the ground or top of house, together with the numerous local peculiarities that every one has specially to battle with. From this it will be seen that the same fixed rules cannot be given for it as for other things.

You may find a hundred photographers who may agree that Mr. Pyro's collodion is excellent, and that they are quite content with it; you may get scores of men to vow that 15 grains of protosulphate make a capital developer, and one which they use from year's end to year's end; but only ask them about "lighting the sitter," and you will find their ideas as various as the colour of their hair. And this diversity of idea will arise from two causes, first, the absence of well defined first principles of what constitutes a well-lighted picture, and secondly, from their ideas being bounded by the special influences under which they have had to work. Few photographers are enabled to build their glass rooms quite as they wish; there are often local conditions which they cannot control, and their future struggle is how to make the best of what they have got. Now, any man who happens to have a room ill placed for lighting, knows the vast amount of pains and trouble and auxiety he has to endure before he masters it, and that at least a twelve month must elapse before he can understand what he can and what he cannot do in his room. Now, when a man has honestly and seriously gone through this work, and eventually succeeded in producing good pictures at all seasons of the year, he must have acquired a deal of valuable experience. Unfortunately, most of this knowledge applies only to the local conditions under which it was acquired, for no sooner is this same man put in a differently situated room than he has to begin again, and pass through another series of trials to discover how to manage this new room. Only those who have passed through these troubles can fully appreciate the force of my remarks. Thus it is that the experiences of clever men get mixed up with so much matters of detail that they cannot compare experience; they gradually acquire the knowledge, and they scarcely know how, and can rarely communicate it to a third party. When Etty was asked how he managed to produce his lovely flesh tints, he replied "He did not know, but he did it." If we ask Mr. T. R. Williams how he manages to produce those delicate half tones, he will probably tell us he "don't know," but he does it.

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* Read April 13th, at the South London Photographic Society.

There are no secrets now-a-days in photography; if I call on that celebrated artist Mr. C. De Vee, and, after looking at his beautiful productions, I ask "whose collodion do you use?" he answers quite frankly "oh, sometimes Mr. Ether's, and sometimes Mr. Alcohol's; occasionally I mix them." "What is the strength of your nitrate bath?" "About 30 grains." "Your developer?" "Iron, about 15 grains." "Your fixer?" "Hypo, always." "Thank you, much obliged. Oh, there's one more question I want to ask before I go, how do you manage your lighting?" "Ah, that's a different thing; I can't answer you. Come up stairs; you shall see my room, and I'll show you." (We ascend.) "You see this room is peculiar. I have a very troublesome light. On a dull day, like this, I work with the blinds as you now see them arranged, but when the sun comes out I have to draw down that blue blind and sometimes that black one; then I draw up this white one as far as I think necessary, and so I get very nice effects. But then it all depends, of course, on the sitter; I arrange the light different for a lady with a light dress to what I should a gentleman with a black coat. Again, it's quite different when I have a child to take and I want to work quick, to what it is when I have an old gentleman who is a good sitter." I leave my talented friend with the strong conviction that all his beautiful effects are obtained solely by his skilful management of his light, combined with ordinary good photography; and that while he can readily give the proportion and particulars of his chemicals and apparatus, yet he is quite unable to give any formula for his management oft he light.

Soon after that master of light and shadow, Rejlander, came to reside in London, I met him one day, and, as if the subject was pressing on his mind, he burst out with "People are constantly coming to me to see how I have fixed my light. Fix my light! I can't fix my light. They seem to think I have some patent way of arranging my windows and blinds, and that's the way I get my effects, and they want to see how it's done. I can't fix my light; the light is always changing, and I have to follow the light, and to arrange my model according to the light. Why, my light is never twice alike. Fix my light, indeed! Good day."

The subject is certainly more difficult than the consideration of chemicals and apparatus, and we shall be less likely to come to a satisfactory conclusion upon it, but shall we not therefore discuss it? For this reason we ought to consider it the more.

Before entering on the principal matter, let us ask ourselves a few questions with a view to getting simpler ideas of what we propose to discuss. "Lighting the sitter;" what do we mean by the phrase? Do we understand it in the artistic or in the photographic sense? It is important that this distinction be clearly drawn.

Lighting the Sitter "*photographically*" means putting him into a much stronger light than usual, and keeping there a sufficiently long time to effect a certain process. In the early days of the art it meant putting him for half an hour in the strong sunshine; now it means confining him for a short time in a sort of glass case. The *arrangement* and *management* of light, to the photographer, means the keeping it on the sitter and off the camera and lens, and also away from the plate during prepartion and development. "Lighting the sitter," *to the artist*, means quite a different thing. It means putting him in a weaker light than usual, admitted through one window only, and allowed to fall in such a way that all the forms and contours of the individual are more markedly seen than in ordinary apartments. After the artist has arranged his sitter, and got the light so regulated as to show all the delicate shades, then it is to the purpose to enquire what he will do with it? He may paint, or draw, or model from it, or he may photograph.

It will be seen that these two classes use the phrase with different meanings. The photographic studio is as much too light for the artist as the artist's studio is too dark for the photographer.

Now, the photographer, strictly speaking, has only to delineate by light, whatever is before his lens. The artist's business is to arrange, compose, select, or reject, according to his idea of art. The true artist thus finds nothing ready to his hand, but, by artificial means, bends, moulds, and improves the raw natural material. The true photographer is a simple delineator.

The two classes are, in their essence, distinct, yet they may be, and often are, combined. The artist may be a painter, a sculptor, or a photographer; and the photographer may, or may not, be an artist. He may photograph things just as they happen to come, never altering or modifying; or he may, by art, so contrive that scarcely anything he does is not influenced and improved by this controlling influence.

Happily, individuals of this class are becoming numerous, and to them the feeling constantly is, how are the great truths of art to be combined with the wondrous graphic power of photography?

To these persons the phrase "how to light the sitter" means, how are the advantages of the artist's studio and the photographic studio to be combined, and the disadvantages of each to be avoided? How shall we put light enough into the artist's studio to photograph the beautiful model without losing the half tones, or how shall we introduce the proper modelling and delicacy into the photographic studio without losing rapidity and brilliancy? All the modernly devised glass rooms have more or less attempted to solve this problem. Not that I attach much faith to any form of glass room; the much more important inquiry is how to use it? I think anyone that visits glass rooms will soon come to the conclusion that no idea can be formed from the shape of the room what kind of picture will be taken in it. And the converse will equally apply—from the kind of picture you cannot infer the shape of the room. Most of us here are aware of the charmingly soft pictures of Mr. T. R. Williams, and also how near Mr. Blanchard's and Mr. Cooper's are to the same character, and yet their rooms are as utterly unlike as they can be, agreeing only in one thing, that they are all singularly unfitted for what they produce. It would seem almost as if the light had made a challenge with these gentlemen and had defied them to produce good pictures in their rooms, and that they had accepted the challenge, had fought, had won, and had made the light do just what they thought proper. One remarkable instance of what a man may do with a bad room was reported to me a while since. The artist in question had a very singular odd shaped glass room built up among the chimney pots, with windows in here and there wherever circumstances would permit, but the whole place was described as a sort of zigzag place without form and void, and darkness was on the stairs that approached it. The artist rather piqued himself on its bizarre effect and its apparent unfittedness for photographic work. He says he don't care for the form of the room, or where the light comes from, he forms on the instant just the light he wants by putting the sitter into a moveable box just large enough for one, and then he puts a sort of tent round, with very narrow blinds on each side, almost like wide ribbons; these he draws down one at a time until he gets such an effect of light and shade as he wishes, The pictures he produces I am assured are really of a very high order. From instances like these it would seen we might paraphrase Pope's couplet.

"For forms of rooms let foolish photo's fight
His can't be wrong whose pictures are all right."

Although apparently any form of room can be worked in beneficially if only the artist knows how, yet I certainly think some are more easily managed than others. There is one form I detest to see, and yet its the popular type—a huge glass box with perhaps some corrugated iron behind the back-ground. Some authorities say, put as much glass in your room as you can, you don't know how it may be needed, and you can by blinds stop out what you don't want. I would rather say put in as little as you need, for until you try you don't know what a quantity you can spare. Where there is so much glass there is a tendency to use it, "What's the use of having glass and not using it." The curious thing is, that beyond a certain small area, all the rest of the glass in the room, not only does no good, but a deal of harm, in causing flatness and fog, and more singular, though there's so much light in the room, the exposure in the camera is not shortened. Let any man who uses a deal of glass window close up by degrees all the distant panes from the sitter, and he will be surprised how many he may stop up with advantage and without any loss whatever.

An artist's studio is a chamber artificially prepared so that all the half tones and delicate shadows of the face would be shown more perfectly than they can be seen in an ordinary room? And why are the shadows less seen in an ordinary room? Because the increased amount of diffused light obliterates them. If this is true in our usual rooms, what becomes of these delicate tones in one of these huge glass cages? Why, they are destroyed on every side, and nothing is left but the hard abrupt shadows, and the broad flat high lights. Some years ago there was a cry raised against white paper skies in landscapes; who will get up an agitation against white paper faces and black shadows? Surely these are quite as unnatural, and more repulsive.

The beauty of a face depends on half tone, on delicate modelling; when seen in ordinary daylight there are no such things even in the oldest and most deeply-wrinkled person as black shadows. They are all more or less grey; and the remedy is better, lighting for the sitter, less abrupt transition from light to shadow. I think the so-called glass room should be looked upon as a piece of apparatus for putting the sitter into—a sort of camera—and the apertures in the sides and roof should be made more after the idea of the artist's studio, that is, not to light the room, but to light the sitter. These apertures or windows, I prefer just now to call them apertures, should be made no larger than is necessary to produce the effect. Every sensible photographer is jealous of each ray of light that enters the camera that does not produce a picture, and so should he be of every ray that enters his illuminating room that plays no part in illuminating the figure. I have called the glass room, for distinction's sake, the illuminating room, and I like the term. It may or may not be a *glass* room; I know of many that have very little glass in them. The glass is a mere accident; it is not the glass that admits the light, it is the aperture in the wall or roof that admits the light, and the glass is merely used to keep off wind and weather. It is these holes or apertures that have to be studied and so arranged as to completely, but gently and softly, illuminate the object. This should be solely the purpose of the room. It may or may not accommodate the sitter's friends or relatives to giggle and laugh and unnerve the sitter; but it should certainly not be constructed to afford that facility.

To be continued.

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Proceedings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the society was held at King's College, on the evening of April 11th. Mr. Glaisher, F.R.S., in the chair.

The minutes of a previous meeting were read and confirmed.

Mr. Willis then read a paper on the "Aniline Process of Photographic Printing" (see p. 186). A number of specimens consisting of copies of plans, tracings, engravings, and photographs were laid on the table, illustrating the excellence of the process for economic purposes. The colour, in most cases, was a greyish black, and for copies of plans, &c., seemed to answer admirably; in portraits, however, there was a want of depth, delicacy, richness, and transparency. It is very probable that these desirable qualities will be attained by the methods with which Mr. Willis is still experimenting; the examples of colour, which he exhibited as illustrating the qualities attainable, being exceedingly rich and deep.

The Chairman, in moving a vote of thanks to Mr. Willis, remarked that such illustrations of progress were very gratifying, and not less gratifying that Mr. Willis promised them details of further experience. In matters of this kind, nothing was attained at a single bound, progress being attained step by step, those results which, for the moment, seemed failures, really being aids to future success.

Mr. Willis, having acknowledged the vote of thanks, and promised to give the society the benefit of his further experience.

Mr. Dallmeyer read a paper on a "New form of Landscape Lens including a large Angle of View" (see p. 184). At the conclusion, he exhibited a number of charming landscapes, by Mr. Russell Manners Gordon, and some negatives by the new lens, taken on ten by eight plates, with a lens of six and three quarter inch focus, showing the large angle covered, and well defined.

The Chairman, in presenting a vote of thanks to Mr Dallmeyer, said the society might be congratulated on being the medium of so important a communication on the advance of photographic optics.

The Chairman then called attention to some fine specimens of Mr. Palmer's "Quinque Gems," and to some very perfect enlargements on canvas by the same gentleman, the method of producing which he (the chairman) regretted was not made known. He also announced that at the May meeting Major Russell would read a paper on "Dry Plate Photography," which could not fail to be very interesting, from the progress that gentleman had already made. He had remarked in his letter, that he had the day before taken a negative containing dark buildings and animals in middling light, in less than a second on a dry plate. They would certainly look with interest for details of a process which would do that. At the June meeting they had the promise of a paper from Mr. Edward Pettitt, on a subject of high interest, which he thought would form a new era in photography. The exhibition of the society, he reminded members, would be opened on the 2nd of May, and the soiree would be held on the 8th of May.—The proceedings then terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this society was held in the City of London College on the 13th inst.; Mr. G. Wharton Simpson, Vice President, in the chair.

The minutes of the previous meeting were read and confirmed.

The Chairman said that he had pleasure in announcing that each member would that evening receive the first instalment of the presentation prints. Three charming prints of lake scenery, on plates 7 by 4½, by the collodio-albumen process, were now ready for distribution to each member. The remaining pictures would be ready, he hoped, very shortly.

Mr. Hughes then read a paper "On Glass Houses and Lighting," (see p. 187). The paper was greeted with repeated marks of approval.

The Chairman said the members had anticipated by their acclamations the vote of thanks he was going to propose. Mr.

Hughes had not only read the paper, but he had discussed the subject for them likewise, and left little room for further comment; he should, however, be glad to hear any remarks on the subject, and Mr. Hughes would doubtless be glad to answer any questions.

Mr. **Blanchard** thought that Mr. Hughes had, in his comprehensive paper, nearly exhausted the subject, and he heartily agreed with him in the greater part of what he had said. It was a great mistake to suppose that one uniform arrangement of light would suit all subjects. It was most important that the light should be under the control of the photographer, so that he might be able to adjust it to suit the particular class of subject which he might be engaged in taking, and thus avoid monotony of effect. The works of some photographers, which were otherwise faultless, were apt to pall upon the senses from their uniform kind of excellence. He felt satisfied that, were photographers inclined to give more time to the subject of lighting, photography might produce as perfect and beautiful results as could be done by the painter or sculptor in their studios. Every ray of light which did not fall upon the subject ought to be stopped out of the studio.

Mr. **Howard** said that the subject before them so pre-eminently belonged to the professional portraitist, that any remarks which he, as an amateur, might make, would not, perhaps, tend to elucidate the subject. His idea was, that as much north light as possible should be admitted into the glass room, not, of course, that it should be used, but so as to enable the operator to vary and alter it so as to produce different effects. He was aware of some amateurs who produced beautiful portraits, but from the cause alluded to there was a want of variety in their productions: each picture being lighted like its fellow, there often seemed a family likeness in the sitters.

Mr. **Robinson** remarked that Mr. Hughes had not said much on the subject of the shape of a glass house. He thought, himself, that the tunnel shaped house was the worst possible in form; and he knew many photographers, who, having built in that form, had to pull down again and rebuild before they could get decent pictures.

Mr. **Howard** remarked that, although a north light was the best, there was the accompanying difficulty that the south light shone into the camera.

The **Chairman** said that Mr. Howard's remarks touched an important point in Mr. Hughes's paper, on the point of establishing the best light, and using it constantly. Mr. Hughes had said that he would rather dispense with as much glass as possible, which, no doubt, would be a very excellent plan, could the exact circumstances be determined under which that light was to be used; but, it appeared to him, that, in deciding the question, a much more perfect knowledge of the principles and practice of lighting was implied than anyone at the present time possessed. If it could be determined, *à priori*, exactly how much ight, and from what direction, would be required, it would be most desirable to have that light and no more. But since the condition, quality, and direction of the light were always varying, and since different subjects required different modes of lighting, it appeared to him that it was better to have more light than was necessary, so that portions could be shut off, as circumstances required. With this view he preferred a glass house of the common rectangular form, and a very complete system of blinds, by which they would have the power of admitting the light from any direction they might choose, either directly in front or on one side. If the house were constructed with only one circumscribed light, there would be no reserve of power to enable a flood of light to be thrown on any particular object. Having decided on the best form of room, it was much better to have more light than was actually required, with perfect means of controlling or excluding it. It was also important that there should be as few reflecting surfaces as possible, over which the photographer had no control. A concentrated light upon a subject was one of the best means of obtaining that definition of contours and half tone which produced the most pleasing pictures, and this could best be secured, he thought, by an extended power of light and well-arranged blinds.

A conversation ensued on the value of diffused light reflectors, for giving detail in shadows.

Mr. **Mertens**[*] exhibited a portrait in which the shadows had been lighted by means of reflectors placed close to the sitter, a plan suggested by Mr. Blanchard.

Mr. **Howard** said, in reference to the name of the photographers' glass room, he thought the term "studio" was a better name than anything else, and suggested that it was a place in which artistic studies were to be pursued.

Mr. **Blanchard** recommended photographers to go to the South Kensington Museum, and examine the glass room there, studying the effects of light and shade on the face.

Mr. **Hughes**, in replying on the various points raised, remarked that he was certain that Mr. Simpson and himself agreed on the point that no more light should be admitted into the glass room than could do good work; it became merely a question of judgment, then, how much to exclude and how much to admit. He detailed much interesting experience in examining the studios of photographers, in order to decide the form in which to build his new studio at Ryde. He had, at one time, nearly decided on a modification of what Mr. Robinson had aptly termed the tunnel shape. He found, from the experience of others, in these rooms, that, in the attempt to get softness, there was a loss of light which made the sitting enormously long, and if the blinds were removed to shorten the sitting, hard, flat pictures only could be obtained.

Mr. **Harman** had presented to the society a large portfolio, for holding their prints, and members need now have no hesitation in contributing. He further announced that Mr Fox, of Little Britain, had kindly remounted the Society's pictures.

Votes of thanks to Mr. Harman, Mr. Fox, Mr. Willis, and Mr. Harmer, who exhibited some reproductions of drawings, were awarded, after which the proceedings terminated.

◆

Correspondence.

THE WET COLLODION PROCESS WITHOUT THE USE OF THE NITRATE OF SILVER BATH.

Sir,—I beg to hand you three more prints by the process about which I wrote to you a fortnight ago.

I have made many experiments since then in order to obtain the exact conditions of success. The chief difficulty being to obtain sufficient printing intensity without overmuch piling up with fresh silver. In order to overcome this, I tried first to add water to the collodion, to make it dissolve more silver in a free state, and so give a better image by the first development. And second, to add silver to the developing bath. The first of these expedients failed to give any improvement in the picture, and the second rendered the bath muddy; but after many trials, I succeeded in adding silver during the first development thus:—As soon as the plate was removed from the dish of developing solution mentioned in my last, I flooded the surface with a fresh lot of developing solution from a small measure, and as soon as it flowed evenly, I added 12 drops of a 30-grain solution of nitrate in the usual way. This developer used on the plate became muddy in about half a minute, but during that time, a very considerable increase in the intensity took place; indeed, the image became almost as intense as an ordinary iron developed negative.

No. 1 was developed in this way.

Nos. 2 and 3 were developed with solutions made up as follows:—

No. 1.—	Protosulphate of iron	$\frac{1}{4}$ ounce
	Glacial acetic acid	$\frac{1}{4}$ "
	Spirits of wine	$\frac{1}{2}$ "
	Water	8 ounces.
No. 2.—	Of solution No. 1.	1 ounce
	Water	5 ounces
	Formic acid	2 drachms
	Glacial acetic acid	1 drachm.

This No. 2 I used for the bath development, leaving the plate in it for about a quarter of an hour; finishing the operation with a sufficient addition of nitrate solution as mentioned before,

This plan of using a formic acid bath may, or may not, prove to be of advantage on further trial, but I think any way, that the first plate done with it seems to have been successful.

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[*] In our last report of a South London meeting, this gentleman's name, in connection with some fine specimens he exhibited, was printed as Nurton, instead of Mertens

The collodion that seems to work best is that made by Mr. Thomas (bromo-iodized): *no* water need be added; it should be carefully mixed in a mortar, with ten grains of nitrate of silver to the ounce, and set aside for two or three days to settle, and then decanted from the residue.

I hope soon to make more experiments, and will let you know soon the result.

I think that Nos. 2 and 3 are not quite so well printed as they might have been. No. 2 being too dark, although the negative is a little underexposed.

With thanks for inserting my last, I beg to remain your obedient servant, Nelson K. Cherrill.

Belmont Lodge, Lee, E.C.

[The further prints enclosed by our correspondent are full of promise, and suggest the probability of a really practical process of wet collodion, without nitrate bath, being attained. Our correspondent adds that he has forwarded some prints to Mr. Thomas's, where they may be seen.—Ed.]

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Photographic Notes and Queries.

Diffused Light in Cameras.

Sir,—The subject of the discussion that ensued last North London meeting, respecting the one half of the plate becoming fogged while the other half was being exposed, has again occupied my thoughts, and the question seems to me to be self solving, and cannot admit of a moment's doubt, could such a thing have been possible, the science of photography could never have sprung into existence. Now, as you rightly observed, that the rays of light, after leaving the lens pass on in a straight line to different parts of the plate, in doing so it follows that they cannot be deviated from their course except by passing through another medium, therefore, every such ray of light exerts its own influence on that particular spot to which it is directed by the lens, and is there sufficiently absorbed by the film, so as not to throw off any reflection; also the inside of the camera being black (not white), is thereby rendered incapable of receiving any to again reflect on the plate, I therefore repeat again that photography would have been a dead letter, could such have been the case. Take, for instance, a photographic print of an engraving, look at it, observe the black and white well-defined lines in juxtaposition with each other, now, if a ray of light could bend or lend itself to its neighbour, it would infringe on the black line and so obliterate it, and the result would be all fog and no picture. It therefore follows, that no matter how the light is kept out of the camera, whether by shade or shutter, the result is the same. Many of your readers may be in doubt on the subject, and the insertion of these lines may aid in expelling it.—I am Sir, yours truly,

E. Aldis.

12, *Arthur Grove.*

Ironing Prints—Caution to Photographers.

Sir,—Having a collection of prints washed and dried, I got my assistant to heat a *flat iron* for the purpose of ironing them; and upon learning from him that it was at the proper temperature, I set to work, when to my surprise, I found the tone of the print rapidly disappearing, and at once guessing the reason, I turned the face of the iron upwards when it presented the appearance of being *electro gilded*, a fine deposit of gold being taken out of the print by the heat of the iron, so much therefore for the mischief of ironing prints with *too hot* an iron.

Determined, if possible, to turn this experience to account, I inspected my batch of prints, and selected two that were considerably *over toned;* and again using my iron, I found the toning gradually leaving the prints, and when of a good rich warm tone, I stopped the operation: instead, therefore, of having two flat, overtoned prints, I obtained two of a fine warm tone, and, in like manner may an excess of gold in toning be removed by *careful use* of a hot flat iron. I enclose a slip of the photograph for your inspection, by which you will see that by reason of the inequalities of the surface; more gold has been abstracted in some places than in others.—I am, yours, &c.,

Alex. T. Z. Brown,
Lieut. R.A. F.G.S. &c.

[We have often found that ironing old hypo or sulphur toned prints with a hot iron intensified the blackness of the tone, and the same process reddened the tone of a gold toned print; but we never met with a case in which the colour was changed to such a golden brown as that of which our correspondent sends us an illustration.—Ed.]

Cracking of Albumenized Paper.

Sir,—Will you allow me space in your correspondence column to draw attention to what seems to me an important defect in albumenized paper, and which does not appear to have received as much attention as it deserves.

I allude to the cracking or scaly appearance of the surface of many photographs. At least two-thirds of all the albumen prints that have come under my notice show some traces of this defect, while many stereoscopic pictures are entirely spoiled by it; among others I may mention some of those of the Exhibition of 1862.

In almost all cases where I have met with it in my own prints I have been able to discover traces of it in the paper before sensitizing; but when I have written to the albumenizer on the subject, it has been attributed to a great variety of causes—as allowing the paper to curl in drying, or drying too quickly; and once, in reply to a query on the same subject in your columns I received the reply, "The cracking may arise from a variety of causes." This reply left me, of course, not much wiser than before.

Is the cause really known? and if so, is there any remedy?

I have frequently seen prints which when finished did not show any traces of it, become covered with cracks after being kept in a warm place for a few weeks.

It seems to me that the fault lies in the preparation of the paper, and I am strengthened in this opinion by having never seen an American print show any traces of the defect.

May it not arise from drying the paper too quickly after albumenizing? and could not something be introduced to give the albumen a little more cohesion?

If you will kindly allow space for this in your columns, or in some other way draw the attention of albumenizers to this matter, you will confer a favour on—Yours respectfully,

Hitchin, April 17th. Geo. Avery.

[We have occasionally seen the defect to which our correspondent refers, and of which he encloses an example, but not nearly with the frequency he mentions. We do not know any specific cause; but it seems most likely to occur with a thin, highly albumenized paper, especially if dried very quickly and very thoroughly. Can any of our correspondents throw light on the subject?—Ed.]

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Talk in the Studio.

The London Exhibition.—Photographers should remember that Saturday is the last day for sending in contributions to the forthcoming Exhibition of the London Photographic Society to be held in the Architectural Gallery, Conduit Street, Regent Street.

The "Oxford Nine."—Naudin has just issued a card picture containing capital portraits of the winning crew in the late race between Oxford and Cambridge, which will be interesting to those of our readers concerned in boating. The same photographer has also issued a 10 by 8 picture of the same group.

"Doubles."—Mr. Gill has just issued two very pretty studies obtained by the method of securing double impressions in the camera. One is entitled "Daydream," a little child sleeping on a chair, whilst her spirit is soaring away in a vision of happiness; the other is entitled "The Way to Heaven," and contains a sleeping child and sleeping mother, the spirit of the child hovering in clouds, and looking towards a distant shadowy cross. Both cards are well managed and pleasing. Messrs. Beckitt and Willis, of Scarborough, send us a clever group of three repetitions of the same person, obtained in the same way, two of the figures being engaged in playing at chess, and a third looking on. The positions, expressions, and whole arrangement are capitally managed.

Diamond Cameos.—On Monday last their Royal Highnesses the Princess Helena and the Princess Louise honoured Messrs. Window and Bridge by sitting to them for their Diamond Cameo Portraits.

Cyanide of Potassium.—Mr. G. Cameron Hodgson, a photographer in Sunderland, is the last victim to cyanide as a poison; he committed suicide by taking some fixing solution after a fit of intoxication.

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To Correspondents.

Tyro.—Plain collodion must, of course, be used for preparing collodio-chloride of silver. If you employ ordinary iodized collodion, the free nitrate of silver would be converted into iodide of silver.

T. C.—We do not know of any very recent work or articles on the waxed paper process. You will find several valuable articles on the subject in the 5th volume of the Photographic News. The Rev. Lawson Sisson's "Turpentine Waxed Paper Process" is published by Marion and Co. We do not know any particulars of the use of acetate of alumina in the development. Can any of our readers furnish information?

J. W. T. S.—In speaking of ordinary spirit varnish, Mr. R. Hughes, of course, referred to the ordinary spirit varnish used for photographic negatives. 2. Over-printed proofs may be reduced by several processes. We have seen very good results produced by the method described on p. 83 of our last Year Book.

One Who Studies the News.—All the numbers for 1864 are in print. We will exchange the one you wish. 2. Yes, we will do so. 3. Most likely American. 4. Over-iodized collodion generally produces streaks at the end of the plate from which the collodion was drained. If we saw an example of the dirty white mark to which you refer, we might judge better as to its cause. 5. You can have letters in answer to an advertisement in the News left at the office without charge. 6. We are aware of the practice; price is, you know, generally a measure of value, and the value may be estimated by the price. We make no comment on the practice, beyond agreeing perfectly with your remarks.

A. Gray.—We have never met with so much loss in the hypo as you appear to have done. There are probably two or three causes: insufficient excess of free nitrate; not printing deep enough, and the use of the hypo solution too strong. Seeing that there is so little silver present a much weaker fixing bath is sufficient. We never use more than 2 ounces of hypo to a pint of water. 2. If for landscapes only, we prefer a single combination to the triple. The triple may be used for portraits in a good light. 3. Much depends on circumstances, we use either pyro and silver, or iron and silver for intensifying, as circumstances may render convenient. 4. In using plates 11 by 9 it is perfectly easy to hold them with the fingers if the opposite corners rest on something.

G. R. B.—Mr. Hughes does not give the exact quantity of water used with each grain of gold, because, we presume, it would vary with circumstances. If quick toning were desired, probably 4 ounces of water to a grain of chloride of gold; if slow toning, twice the quantity of water.

Leo No. 2.—As the question whether an idea can be protected at all, and if so, what mode of protection is available, depends so much on the precise nature of the idea, it is, we regret to say, impossible to give you any advice on the subject without knowing details. We should have been glad to aid you, but cannot possibly do so from an indefinite description. An inventor has an undoubted right to protection if his invention be one which comes within the intention of the law. There are some things, however, which are difficult to protect, and useless if kept secret. With more information we can give you better advice. Your first letter was mislaid and caused delay. In answer to the second, the design you give is no infringement of existing rights.

Lux et Salus.—It is probable that your room will answer well; but we should prefer the side light reaching as high as the roof light throughout.

C. A.—If you immerse a piece of tin, or more properly, tinned iron into your bath, you will run a great risk of spoiling it, and will certainly reduce a portion of it.

W.—We have not worked the "Eburneum" process ourselves, nor had communication with anyone but the inventor, who has. He has described the process to us, and we see no difficulty in it; neat manipulation and care will be required, but with this success must follow.

W. H. J.—The general brown deposit during intensifying may arise from a variety of causes. The presence of organic matter in the bath will sometimes cause it; imperfect washing of the iron solution away before applying the pyro intensifier; the use of too much silver in the latter or the use of it from the bath instead of a fresh solution. The free use of citric acid in the intensifying solution is frequently a remedy; and a certain remedy is the application to the film, after washing away the iron developer, of a solution of iodine one grain, iodide of potassium two grains, in water one ounce. Let this remain on the plate about a minute, wash, and then intensify. 2. You have probably over-saturated your bath with iodide. 3. We shall have pleasure in giving you our opinion on the lighting.

Actinism.—The peculiar effect is probably due to imperfect contact between the surface of the card and the enamelling preparation. 2. You may thin the varnish with methylated alcohol. Is the ridge caused by the partial dissolving of the film? This sometimes happens. 3. No absolute rule can be given for the time of immersion in the hypo; but as a rule from 10 to 15 minutes are sufficient. If left too short a time the prints will generally discolour during washing. If too long there is the danger of over-reducing and giving them an impoverished effect. If the hypo solution be new and not acid, that is the only danger of too long an immersion. If the hypo solution be the least decomposed, sulphur toning will be induced by long immersion, which will injure the purity of the half-tones and endanger permanency. 4. Acetate of soda will keep in solution. 5. It is difficult to add nitrate of silver and chloride of calcium to collodion; but it might possibly be managed; 1½ grains of the latter is the quantity per ounce. We believe that collodio-chloride prepared for use is sold by several houses; but we do not know anything of the price, &c. 6. The figure is lighted too directly from the front, and the face is consequently flat. It would have been better for deeper printing.

L. A. D.—It is probable that under-exposure was the cause; but with plates prepared by an unpublished formula it is difficult to speak with certainty. Write to the preparers of the plates—they will probably give you information. The light has been very bad until the last week or two, and an exposure of three times as long as you gave would probably be required.

W. Currey, Bolton.—The cards are very excellent, being delicate and brilliant. The portrait of Henry Vincent is very good.

J. E., Ballymena.—It is probable that the blotting paper might be used several times, using the quantity last used for one lot of prints, for the first use with another. We believe, however, that the same plan can be adopted without the blotting paper. There is no certain method of detecting the presence of hypo in minute traces. A good plan is suggested by M. Carey Lea, which you will find on p. 79 of our Year Book. Dr. Vogel suggested a plan in a recent letter in our pages, in which a piece of a negative film, which had been treated with bichloride of mercury was used. Protonitrate of mercury, permanganate of potash, and nitrate of silver have all been proposed and used with more or less of success. The lighting of the card is pretty good, but we prefer a little more definitely marked light and shadow on the face.

Sea Side.—It is very difficult to say what the accumulations in a printing bath may be, which has long been used with various commercial samples of albumenised paper. The salt, a little of which you enclosed in your letter, appeared to be carbonate of silver, and was readily soluble in nitric acid. It is probable that the whole of your crystals may be converted into nitrate of silver again by means of nitric acid.

P. B. (A Regular Subscriber.)—Old negative baths may be used for printing, but the iodide of silver present is apt to render toning more difficult, and the prints are rarely so rich and perfect.

B.—The object of adding liver of sulphur to the hypo and other solutions is to throw down the silver as a sulphide. When the black turbidity, caused by this addition, has settled, take a little of the clear liquid, and test it, by adding a few drops of a fresh solution of the liver of sulphur; if this cause further turbidity, it shows that the whole of the silver is not precipitated, and more must be added until it is. If it remain quite clear, all the silver is thrown down. It is quite impossible to give any proportion to be added to "a gallon," inasmuch as we do not know how much of the silver salt is present in the gallon. The proper quantity can only be ascertained by testing and observation. The black precipitate is to be dried and reduced, as directed in the various articles on the subject. You will find full directions in our Year Book for 1864.

Moist Plates.—It is safer in all preservative processes, to wash the plate slightly in a bath of distilled water. The best preservative is that given by Mr. Blanchard, in our Year Book for 1863; sometimes golden syrup and water, equal parts, with a few drops of acetic acid to each ounce, form a good preservative for a few hours. We do not know anything of the recipe you give, nor do we quite see its object. The addition to the preservative of nitrate of silver, and then of an iodide, will simply produce some waste of nitrate of silver.

Artist.—We regret exceedingly that we cannot give you any efficient advice. If anyone detains the specimens of an operator seeking an engagement wilfully, it is a mean kind of dishonesty, which, if proved, could of course be punished. The difficulty in all such cases is proof. In this instance it appears that it is alleged they were returned by post. The difficulty is to prove that it is not a case of postal miscarriage. Try writing again to Aberdare.

C. W. C.—We believe most of the dealers now keep non-actinic glass. The non-actinic varnish given in our last Year Book answers well. We believe most of the collodion makers would supply you with a little pyroxyline. If adding alcohol to your developer make it flow worse, it is a proof that none is needed; with a new silver bath alcohol is rarely needed. Covering the plate without stoppage in the flow of the developer is a matter of manipulation which can only be mastered by practice.

Stamford.—Any good quarter plate lens will answer the purpose.

J. S.—The sample of pyroxyline appears to be in good condition, notwithstanding its long exposure to a southern sun. We have very rarely met with a case of decomposition in pyroxyline where it had been properly made and carefully washed. The result of the experiment you mention was singular. We can only regret that the opinion we gave was injurious or painful to you. The card you enclose as the work of a professional photographer is sad rubbish. We compared the examples of your work by a high standard, not by smudges unworthy of the name of photography. Your position is much better than that of the producer of the card you enclose.

North W.—We are somewhat at a loss to understand what our correspondent means, when he says he has a north-side light, and "consequently," is much troubled with the sun. On the north side you should not have direct sunlight at all. From the west you will have direct sunlight, through the top-light, and we do not know that you can do better than have blinds of calico. We cannot undertake to say what will constitute an infringement of Mc Lachlan's patent, as we are uncertain in what it consists.

A Canadian.—The "Kalochrome Paper," referred to, is prepared by Beyrich, of Berlin, and sold by his agent, Mr. Trübner, in this country.

C. P. Riversdale.—The lower-priced article is not bad, but the highest is, in our opinion, fully as much better and more certain, as the price indicates. It is probable that the non-actinic varnish would answer in a tropical climate, but we have no actual knowledge on the subject. We are not aware whether it is sold, ready for use or not, by any one, but it is easily made. You will find a recipe in our last Year Book.

C. G., Beverley.—Your specimens have only just arrived as we go to press. Comment next week.

John Stone.—We have received your interesting specimens, and shall be glad to learn more about them.

T writes as follows:—"I beg to correct what appears to be an error in your impression of the 7th inst., as regards my letter on p. 166, viz., line 10 should read: '—— has the blue colour restored, now warm, and coat the plate.' Also line 37, instead of 'for,' read 'four.'"

Several Articles and Advertisements are compelled to stand over. Several Correspondents in our next.

Registrations have been duly attended to, and will be specified next week.

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THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 347.—*April* 28, 1865.

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DIRECT PRINTING ON OPAL GLASS.

From the communications of correspondents we learn that whilst the taste for pictures on opal glass appears to be on the increase, the usual methods employed of printing by development are far from being generally successful. If sufficient exposure and development be given to secure detail, the delicate portions of the image have a tendency to be buried in the film giving fine effects by transmitted light, but looking dull and heavy by reflected light. If the exposure be shorter, or the development be quickly checked, a slight tendency to hardness and lack of detail are the dangers incurred; the *juste milieu* being very difficult indeed to hit: added to this is the difficulty of securing a satisfactory tone without the use of mercury or a sulphide, both of which are more or less objectionable.

It is tolerably certain that any method of direct printing on glass will possess advantages in these respects, and the result of experiment with our own process, the collodio-chloride, leads us to the conviction that it is in many respects immeasureably superior to any other method of printing on glass, which we have yet tried, both in simplicity, certainty, and beauty of result.

Until recently our chief attention has been given to the application of the collodio-chloride to paper, two or three experiments with some preparation, successfully used for paper, not having been found quite satisfactory on glass, a somewhat feeble grey image being the result. It appeared to us that some trace of organic matter was necessary to secure the desired vigour and richness of colour. A hasty trial of the only suitable preparation we had at hand confirmed this conviction. A plate, coated with the raisin syrup of Mr. Sebastian Davis, prepared three or four years ago, for use in the modified Fothergill process, was applied to a plate which, when dry, was coated with the collodio-chloride we had in use. This printed very rapidly, giving a rich, vigorous, brown image, which toned readily to a very agreeable colour. We did not proceed further with the matter at the time, leaving the trials with other substances, such as albumen, gelatine, &c., on the glass; or resins, sugar, tannin, glycerine, citric acid, &c., in the collodion, for future trial. The last-mentioned two substances had been tried by the "Photographer's Assistant," for paper printing, with considerable success, and promised well for printing on glass.

Before we commenced to carry out our experiments we received from Mr. Swan, of Newcastle-on-Tyne, a very charming specimen on opal glass, which, he informed us, was produced by means of our collodio-chloride process. Shortly afterwards we received a bottle of the collodio-chloride, prepared for printing on glass, with which the specimen was produced, and Mr. Swan supplied us with details of its preparation. He had tried various organic additions, in order to get sufficient vigour, and had found that nothing gave such good results as citric acid. The collodio-chloride for the purpose was prepared very nearly in accordance with our own published formula, with a little citric acid added. The proportions of sensitive salts were eight grains of nitrate of silver, two grains of chloride of calcium, and one grain of citric acid in each ounce of collodion. This collodion, we found, gave prints on glass perfect in tone and colour, without the slightest difficulty.

We next tried it on paper, and although it was extremely sensitive, the results were comparatively worthless, so feeble and wanting in vigour. Here was a very curious circumstance. The collodio-chloride, which we found work well on paper, giving great vigour, did not, for several reasons, work well on glass; whilst that which gave very perfect results on glass was feeble and poor on paper. The difference in result appears to be chiefly due to the difference in the proportion of free nitrate present. In all our experiments on paper we found that the presence of sufficient free nitrate of silver was the point of vital importance in securing vigour. But this amount of free nitrate in the collodion when used on glass was apt to crystallize on drying, giving a slightly mottled effect, with minute spots of insensitiveness, and a general want of vigour; whilst Mr. Swan's collodion containing less free nitrate, but having an organic body present, answered well.

We subsequently tried a variety of preliminary coatings. White of egg one part, added to water six parts, and well beaten, applied as preliminary coating, answered well, giving a rich brown image. Gelatine five grains, and water one ounce, used as a preliminary coating, gave a reddish purple image. But neither of these were so good as the raisin syrup, nor quite so good, we think, as the collodio-chloride with citric acid, without preliminary coating. In using the latter, however, a difficulty was met with at the outset, which, although it is chiefly due to the use of a very contractile collodion, the reader should be prepared for: the film has a great tendency to leave the glass. This may be overcome in various ways: we found a very efficient one consisted in coating the edge of the plate for about one-eighth of an inch all round, with the dilute albumen we have described, before applying the collodio-chloride. The film then adheres perfectly, and no trouble is experienced. We may here notice an interesting circumstance which occurred, which possibly may prove useful, and which appears strikingly in opposition to the theory recently referred to by Mr. Sutton, to the effect that the presence of organic matter in connection with chloride of silver promoted vigour, but decreased sensitiveness. All the plates we have tried, which have been thus coated with albumen at the edge, have shown an increased action of light at that part, giving a darker line around the edge of the plate, indicating an increase of sensitiveness, as well as accession of vigour, in the part where the very slight trace of albumen was present.

Mr. Swan, in his communication, which appears in another column, states that he finds a longer exposure is necessary than for albumenized paper, and that a great reduction takes place in the processes of toning and fixing. This is not altogether in accordance with our own experience. In our hands, the printing has appeared very rapid, an excellent print of sufficient depth being obtained from a good negative with an exposure of five minutes to sunlight. It is probable that this discrepancy may be explained by the different modes of toning we employed. Mr. Swan employed an acetate bath, which he finds reduces the depth of the print very much. We happened, at the time of our experiments, to have no acetate or lime toning bath ready prepared, and as time is necessary for the fruition of these baths, we tried the simplest impromptu alkaline gold bath we could make, consisting of one grain of chloride of gold, one grain of carbonate of soda, and five ounces of hot water, using it about a quarter of an hour after it was made. The effect on a considerably overprinted impression was startling: in a moment after the first contact the impression was reduced to a very pale one, and the colour changed from a rich reddish brown, bronzed deeply in the shadows, to a greyish black, which the hypo did not change at all. It is clear, therefore, that the ordinary alkaline gold toning baths, if employed, should be used very dilute indeed, and sufficiently old. We next had recourse to an old sel d'or bath we had at hand. The result of this was everything which could be desired, the impression, without being overprinted more than for an albumenized paper print, toned slowly and gradually, and lost very little in depth, either in the toning bath or the subsequent hypo fixing bath. Rich warm sepia tints, rich purple or pure blacks were easily secured by this bath.

One of the great difficulties of printing on such substances as opal glass consists in the difficulty of watching the progress of printing, as the glass cannot of course be turned back to examine like paper. There are various modes of meeting this difficulty. If the negative and glass be attached by a piece of gummed paper, the latter may with care be lifted up and examined, and then replaced without moving. Mr. Tunny, whose method of printing on opal glass we give on another page, has devised a printing frame which permits the glass to be lifted and examined without any danger. Mr. Shive, in America, has patented a printing frame for a similar purpose, the negative being fixed in another half of a frame which opens on hinges, each half falling back like the covers of a book; this, when opened, permits the progress of printing to be examined, and when closed again the negative and glass come into contact again without possibility of either moving. We have devised a very simple impromptu method of obtaining the desired end. As in many cases, especially when the opal glass is intended to contain a certain miniature bust for bracelet, locket, &c., the glass is smaller than the negative, we place on the lower half of the latter, a piece of glass or card, as thick as the opal glass, this supports one half of the hinged back of the printing frame. The opal glass is then placed on the negative, so that it shall only be pressed by one half of the hinged back, and when it is placed *in situ* on the negative, a little gum or india-rubber cement is placed at the back, and the back-board of the printing frame brought into contact and hasped down. When it is necessary to examine the print, the half of the hinged back is carefully raised with the opal glass cemented to it with the gum or india-rubber: when the back is shut down again, the opal glass of course falls on its proper place on the negative. It is probable we should think that suitable printing frames will soon be obtained in commerce.

The applications which may be made of this simple mode of printing on glass are very numerous. Mr. Tunny points out several for his process, and we need scarcely say that they will all be equally applicable to our own. Mr. Swan refers to the advantages of reproducing negatives by such a method: as a means of printing lantern slides, also, this will probably be very valuable. For miniatures in cases, or for bracelets, &c., with a glass cemented in contact, after the manner recently adopted by Messrs. Helsby & Co., and earlier still by Mr. Skaife and Mr. Cutting, nothing can be more beautiful, or more simply produced.

There remains one thing to be wished for; an improvement in the colour. Mr. Sutton has properly pointed out that the colour of cream would be much finer than that of blue milk for the whites of a picture, and that opal glass most resembles the latter. A considerable improvement has recently been made by the employment of a pure white pot metal instead of a flashed surface of white: but a decided cream colour or india-tint would be still more an improvement. We have recently been experimenting on various substances, such as white *papier mache*, prepared expressly for the purpose. There is a wide field of application in new directions of this kind, but we must reserve details for our next.

ON THE TREATMENT OF GOLD AND SILVER IN PHOTOGRAPHY.

BY C. OMMEGANCK*.

The employment of plates of copper for the same purpose was suggested as a very important improvement, and as solving most of the difficulties: still, notwithstanding all the respect we entertain for the great authority of those who have recommended it, we cannot advise it to be employed. The principal reasons that have led us to reject it are, that by its means the revivification of the precious metals is slow and incomplete, especially during the cold of winter. If the loss does not exceed 5 per cent. in solutions of hyposulphite at 18 per cent., this loss is very much greater when the first washing water is added to the fixing bath, which reduces the strength of the solution to nearly 8 per cent. Large volumes of liquid demand plates of large surface: when these plates are new, and more or less polished at the time of immersion, they sometimes become covered with a film of metallic silver sufficiently adherent to retard all further reduction. When they begin to be corroded and rough, the metal is deposited in the cavities, from whence it is difficult to remove it: it is not on this account lost, it is true, but yet it diminishes in a striking degree the quantities that can be turned to account, and, finally, when the plates finish by falling to pieces, they form fragments very difficult to deal with in a photographic laboratory. But the most serious inconvenience, after all, consists in the fact, that from several causes the revivification of the silver at the expiration of a few days is often very far from being complete at nearly 5 per cent.. and that generally the operator does not possess the chemical knowledge necessary to inform him of the degree to which the reduction has advanced; for, according to experiments that we have made, a well cleaned plate of copper, having remained for twenty days in a bath of argentiferous hyposulphite, was replaced on two occasions at intervals of twenty days by a new plate of copper, and each time it deposited a film of silver strong enough to support itself.

The reaction we pointed out by means of a salt of lead in our process, removes all uncertainty from the mind even of the least instructed operator, and in avoiding mistakes which would sometimes result in making hundreds of francs pass into the sewer.

The brown colour mentioned above indicates that there is a minimum quantity of free sulphide of sodium in the liquid, and that the gold and silver have been wholly precipitated in the state of sulphides. When the quantity of black matter accumulated upon the filter has become sufficiently important, and is nearly dry, it is removed from the filter as completely as possible, and intimately mixed with an equal weight of nitrate of potassa in fine powder; the mixture is then dried, and heated to a dull red in a large clay crucible, taking care that the bottom of the crucible is less heated than the upper portion, which is accomplished by placing the crucible directly upon the grating of the furnace, and introducing, in small quantities at a time, some of the mixture of nitre and metallic sulphides. A new charge is not introduced into the crucible until the first one is completely burned.

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* Continued from p. 78.

In this reaction, the oxygen of the nitre burns the sulphur of the sulphides; the gold and silver return to the metallic state, the sulphur passes to a higher state of oxidation or sulphuric acid, and unites with the potassa to form sulphate of potassa: the small quantity of hyposulphite which may be found mixed with the sulphides is also converted into sulphate. In this operation the heat must be skilfully managed, and the fusion of the mass avoided.

When the crucible becomes full, it is removed with the tongs, and emptied, while it continues red hot, with the assistance of an iron rod, and the operation is continued until the whole of the sulphur is burned. The whole is collected into a large jar. The matter that adheres to the crucible may be easily removed with water, and the crucible may be employed for the same purpose a great many times. The product obtained is too bulky to be advantageously melted, on account of the quantity of salts mixed with it: it is therefore washed with hot water, and decanted, until the water comes off tasteless: this decantation may be made very quickly if care be taken to pass the washing waters through the linen filter, upon which the sulphides are collected, in that case, the small quantity of metallic powder in suspension is not lost, and the operation proceeds quicker.

Finally, a nearly pure metallic powder is obtained, which, being dried, occupies a very small volume: it may be melted in a crucible on tenth the size necessary before the last washing, the loss will be ten times less, and the fusion may be performed in an ordinary stove. A metallic button is readily obtained, composed mostly of silver, alloyed with 2 or 3 per cent. of gold, plus a certain quantity of copper, and sometimes of lead: a small quantity of borax (1 per 100), and 5 per cent. of dehydrated carbonate of soda is then added as a flux. The button may be left to cool in the crucible, which is subsequently broken to remove it. But it is better to pour the melted metal into an ingot mould or into an iron capsule, warmed, and slightly oiled. When the metal is left to cool in the crucible, it often becomes mixed with the scoria or the impurities of the flux. These impurities subsequently find their way into the nitrate of silver prepared from the metal thus obtained.

The residues arising from the combustion of paper are melted in the same manner: the products of the washing of proofs before toning, after being converted into chloride, mixed with gold baths, reduced to the metallic state by sulphate of iron, and themselves reduced to the metallic state by zinc, are also melted separately or simultaneously, conformably to what has been prescribed. The ingots, being scraped, are passed to the rollers, and then treated with ordinary nitric acid to convert them into nitrate. The nitric acid of commerce usually contains chlorine, sometimes iodine and bromine: it is purified from these by pouring into it a solution of nitrate of silver until a precipitate ceases to be thrown down; it is left to settle, and the limpid acid is decanted and employed to dissolve the metal. After complete solution, a black powder is found deposited, which is metallic gold. The liquid is decanted, the black powder washed with water, the water is added to the decanted liquid, which is evaporated to dryness, and the solid matter is fused. This fused nitrate is good for sensitizing paper. The gold powder is treated by a mixture of one part nitric acid, and two parts hydrochloric acid: the chloride of gold obtained is evaporated in presence of a quantity of common salt equal in weight to the metallic gold treated: we thus obtain chloride of gold which may be immediately used for preparing toning baths.

In our next communication, we shall treat of the revivification of negative silver baths, and of the obtaining of chemically pure nitrate of silver suitable for making these baths.—*Bulletin Belge de la Photographie.*

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COLLODIO-CHLORIDE ON OPAL GLASS.

Sir,—I have lately been applying your *Collodio-chloride process* to printing on glass, and have succeeded so well as to induce the belief that this is one of its most valuable applications. Prints upon glass have usually been *developed* more or less in the *manner* of a negative, the printing process being only *commenced* by the action of the light, and carried to maturity by a developing solution. It has long appeared to me that the finest results in printing upon glass were to be obtained by *direct solar printing* in contradistinction from *development printing*. One can, by direct solar printing obtain much finer definition and a more perfect register of the various grades of density in the negative than by development. I feel persuaded that by your process, copied negatives may be made very nearly as sharp in definition as the original, and quite as perfect in half-tone; indeed, if the original negative be defective in this last-named quality, either by being too dense, or two transparent, the copy may be made even *better than the original.* You will think of many important uses to which this new power in photography may be applied. For instance, in the case of a very valuable negative, from which prints in large numbers are required, a good transparent print from it may be made a veritable "mother of thousands," *very nearly as good in any case* as the original, and *in some cases better.* What facility this gives for rapid printing! Where time presses, and numbers are wanted, *ten* or *a hundred* negatives may be laid under contribution, and the work be done *ten* or *a hundred* times faster than usual! This is scarcely a practicable thing where negatives are multiplied by development-printing. Develop how you will, *some* of the fine detail of the negative is lost, and some of the gradation too, or to say the least as to gradation, you have not the same command over it as when the whole work is done by the sun. In my first experiments I was met by two difficulties:—In the first place, the film of collodion had a provoking tendency to leave the glass. This I overcame by coating the edges, and a narrow border of the plate, before collodionizing, with ordinary negative varnish. The other difficulty was the feebleness of the image produced by the simple collodio-chloride. I found that the addition of a citric acid in minute quantity, completely, and in a most remarkable manner, removed this last-named difficulty. With this addition, one may get any degree of vigour that may be desired, and by adding more or less, can modify the character of the collodio-chloride to suit weak or strong negatives. Probably tartaric and other analagous organic acids will have a similar effect. The action of the citric acid, in so greatly increasing the vigour of the print, is well worth studying, with a view to its bearing on the rationale of ordinary silver printing. I think it throws much light upon some of the unexplained phenomena of that process.

In toning prints upon opal glass I have not succeeded so well with the mixed sulpho-cyanide of ammonium and chloride of gold, as with the ordinary alkaline gold toning, and separate fixing with hypo. I have found Maxwell Lyte's phosphate of soda toning solution act excellently after being kept mixed for about a week. When freshly mixed, its action is too energetic.

Have you seen any of the opal glass portraits *coloured?* They look *very pretty indeed!* and I am told, can be done very quickly.—Believe me, Sir, very truly yours,

Joseph W. Swan.

THE ANILINE PROCESS OF PHOTOGRAPHIC PRINTING.*

BY W. WILLIS.†

Now began a most perplexing and uncertain variety of tints; not in one and the same picture, which always developed with remarkable uniformity, but in succeeding ones, when the materials or the manipulation were varied in the least degree. A difference in the colour of the finished print was produced apparently by the most trifling causes, such as changing the kind of paper used, or mixing a fresh quantity of the sensitizing liquid. The greatest defect was a tendency in the pictures either to develop green, or to change to that colour, within a few days afterwards. In order to overcome this defect a most extensive series of experiments was prosecuted to ascertain what influence the introduction of various metallic and other salts in the chromatype mixture would have on the colour of the finished picture. The labour and time bestowed on these trials are regretted now, having lately discovered that the tint of the picture depends more on the proportion of the acid mixed with the chromic salt, than on the presence of a metal or any other extraneous substance in the mixture. For a long time copper was thought to be essential to the production of a fine black; but it was afterwards discovered that quite as intense a black could be produced when the chromatype mixture consisted merely of an alkaline bichromate with a little sulphuric or phosphoric acid. Later experience seems to show that the colour depends on the degree, the rapidity, and the manner in which the aniline is oxidized by the chromic acid; also, to some degree, on the quantity of free acid present to alter the colour thus produced. When the quantity of acid is extremely small, the picture will not develop at all: with a little more it will develop slowly and of a reddish tint; with a further increase, the picture will be black, and with a still greater amount, either blue or green.

The next step was to ascertain whether any other substance than aniline could be used for development. Toludine when pure, gives an orange-brown tint. Commercial samples of this base develop much like aniline, probably owing to the presence of the latter as an impurity. A great number of other bases were tried, and several gave indications of colouring power. One of these possesses the required property in so eminent a degree as to surpass aniline greatly in the intensity of its browns and blacks, and in their permanency. Not having yet completed my researches with this material, I must beg to be excused from mentioning on the present occasion anything else respecting it, but a few of the valuable qualities it seems to possess. I hope a future opportunity will occur to lay before this Society a complete account of this substance, and the best mode of using it. At present it is not an article of commerce, and, I believe, has not yet been named. Its most remarkable characteristic, is that of producing, in contact with chromic acid, a colouring matter that is proof against the most violent chemical reagents. The mineral acids and alkalies scarcely alter its tint, which will therefore probably prove to be absolutely permanent. It would almost appear that the chromic acid chars the developing material to a considerable extent, and so produces a colouring matter rich in carbon. If this should be confirmed, this method of printing will prove to be the true carbon process.

The unalterability of this colouring matter by acids and alkalies gives us the great advantage of being able to remove all the chemicals from the ground of the paper, and to restore it to its primitive whiteness. This cannot be done with aniline development without considerably altering the tint of the picture. The alterability of aniline by these reagents is, on the other hand, some advantage, as it enables us to get pictures in very varied tints; a wash in acids giving rise to blue or green, and one in alkalies to a rose or purple colour.

A brief synopsis of this aniline process of photographic printing will now probably be acceptable. The sensitizing liquid consists of a solution of the bichromate of potash or ammonia containing a small quantity of sulphuric or phosphoric acid. This liquid is applied to paper either by sponging or by floating. When dry, the paper is exposed to light under a positive photograph or a drawing, after which it is placed in an atmosphere charged with the vapour of aniline. Finally, the print is washed in either plain water, or first in weakly acidulated water, and subsequently in plain water.

Advantages of the Process.

The advantages which this method of photographic printing may reasonably claim over those now in use are:—

1st. *Extreme Simplicity of Manipulation.*—The method of coating the papers and their exposure to light is the simplest possible, and the development incurs no more labour than the placing of a print in a portfolio. This development also fixes the picture, so that it may be left without any washing, if the tint of the paper and a slight veiling of the picture be not objectionable. It is, however, improved by washing in plain water for about ten minutes. The contrast this presents to the lengthened and laborious washings of silver prints is very striking, and is a matter of considerable importance, especially when large prints are done.

2nd. *Greater Sensitiveness to Light.*—The time of exposure amounts to about one-third of that of silver prints. In sunshine, copies require from two to ten minutes, according to its intensity, and from fifteen minutes to half an hour in diffused daylight.

3rd. *Extreme Cheapness of Materials.*—Here the advantage is very considerable, the chemicals required being of very low cost, and easy procurable. This would enable life-size portraits to be issued at very moderate rates.

4th. *All necessity for Mounting is abolished.*

5th. *Facilities for getting Finished or Touched Pictures.*—In the present system of printing from *negatives*, all defects in the copies have to be remedied by touching every individual print. But by this system of printing from *positives*, a careful touching of the first positive will ensure equally finished copies in all that are printed from it.

6th. *It enables Copies of Drawings to be taken without the previous production of Negatives, and without the use of Cameras or other costly Apparatus.*—All the apparatus necessary for working the process being a flat board, a blanket, a shallow box, and sheet of plate glass.

Defects of the Process.

I cannot claim to have brought this method to perfection; it would be scarcely possible for an individual to do so with any photographic process. There may be also one or more defects inherent to the method, and which cannot, therefore, be remedied. Fully persuaded I am, however, that its merits greatly exceed its defects.

It falls short of silver printing chiefly in the want of transparency. There is more or less of a matted appearance in the shadows, which prevents the full amount of detail from appearing. This will be overcome when a method has been discovered of keeping the chemicals on the surface of the paper. Unfortunately, it is difficult to accomplish this by means of a glazing material, such as albumen, in consequence of the chemicals forming therewith an insoluble compound on exposure to light, and thus preventing their removal by washing. The formation of such a compound takes place in ordinary silver printing also, but is there an advantage, because such insoluble parts constitute the picture, and remain fixed, whilst the soluble white parts are removed by washing. Although my experiments in this direction have been very numerous, the subject is far from being exhausted, and I have strong reasons for believing that this difficulty will be overcome.

One of the greatest perplexities that will be found to attach to the *working of the process* is that of exposure. This is a matter of much greater nicety than in printing from negatives, and is more difficult to judge of. The difficulty is not, however, nearly so great as in carbon printing, because there is sufficient appearance of the picture to enable one who has practised the method for a short time, to tell certainly when the exposure has been continued long enough. After a little practice and working in one and the same locality, few or no failures will occur from this cause.

Some persons will reckon the necessity of procuring a positive before printing as one of the defects of this process. But this is counterbalanced by the facility afforded for retouching such positive, and thus rendering all the copies free from defects. Independently of this, the extra labour involved in printing a positive on glass, by the tannin or other dry process, if such plates were kept in stock, would be so slight as to be scarcely appreciable.

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* Concluded from page 187.

† Read at the Photographic Society, April 11th.

Applications of the Process.

The applications of this method of photographic printing are limited to the multiplication of positives from other positives. In consequence of this, and of the granulation of the paper, I believe the most extensive use of it will be the copying of drawings by engineers, architects, and manufacturers. These are generally made on tracing paper, and are thus sufficiently transparent to be copied in this way. The commercial value of the process in this respect alone is somthing considerable.

The multiplication of artists' drawings is another application which will speedily be made of this process. Facsimiles of the sketches of our best artists will then be procurable, and more sought after than engravings are at present.

The copying of manuscripts, legal documents, maps, music, and writings on parchment, is another valuable and extensive group of purposes in which this process is available.

In ordinary photography, I believe it will prove by far the best process for copies of life-size portraits. The granulation of the paper, so offensive in small subjects, is here an advantage, giving a texture and a degree of boldness that are suitable to such pictures.

For transferring designs to wood blocks, it will probably prove the best photo-process; also for printing on silk.

Permanence of the Pictures.

Most persons will be ready to exclaim, after hearing how these pictures are produced—"Pictures in mauve! They will prove as fugitive as mauve-dyed fabrics!" In answer to which I have to say that mauve is the most permanent purple dye yet discovered, and when it fades it does not bleach out, but merely changes its tint. But these pictures have only a small quantity of mauve in their composition. The materials used in their production are the same as those used to produce the dye, and in the production of this dyeing material, the quantity of mauve obtained is but infinitesimal compared with that of a black substance that is at the same time formed. Now this black substance has been found to have extraordinary persistence of colour, so much so, as to resist two or three successive applications of powerful bleaching operations. I state this on the authority of others, as quoted in scientific periodicals, not having proved the matter for myself. I have always found the aniline-developed pictures to be more changed by acids and alkalies than should be the case if the black compound formed so large a part of the colouring matter of the picture. Still, if they are changed in tint by acids and alkalies, they are not destroyed by these agents, and when exposed to the action of light, air, and moisture only, seem to be remarkably permanent. If, in preparing the sensitizing solution, the phosphoric acid has not been carefully proportioned to the other ingredients, and it exists in slight excess, the pictures will, as before described, develop either blue or green, or will fade to a green after a few days. Pictures that show no such tendency, after a week or two retain their tint perpetually. I have suspended aniline pictures to the walls of my laboratory for twelve months, without perceiving any alteration in their strength or their colour. There is, on the table, the first aniline-developed picture which was taken January, 1863, and which has not lost any strength by being kept in a portfolio ever since.

Pictures developed by the new developer to which I have alluded have, however, no mauve or aniline-purple in their composition, and are little or not at all changed in tint by the application of acids and alkalies. They will, therefore, probably have still greater permanency than the anilitypes; and should they prove to consist mainly or entirely of carbon, such production of carbon pictures by chemical action will certainly be a novel and interesting discovery. But whether these pictures prove to be carbon pictures or not, they will, unquestionably have a high degree of permanency, and being producible by such simple manipulation, they cannot fail to be largely used by the public.

A process so useful to almost everyone, and which almost everyone may perform, should be public property, and ought not to be hampered by patent exclusiveness. Since that, however, appeared to be the only means by which I could be recompensed for the time, labour, and money expended on it, I was bound to seek royal protection in the limitation of its use.

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NEW COLLODION PRINTING PROCESS, APPLICABLE TO VITREOUS, ENAMELLED, AND OTHER SURFACES.

BY JAMES G. TUNNY.*

I do not know, all things considered, if I have selected the most judicious title for this paper, knowing that it is hardly possible, when there are so many anxious experimenters at work, to produce anything entirely new; for in all probability, many have been working in the same direction, and perhaps a number of these may have actually wrought out for themselves what I may consider new in this process. But even at the risk of being told that there is nothing new—very probably informed that the whole has been previously published—I will venture to introduce to your notice, under the above christening, the process that I have the honour to lay before you this evening.

In one sense, it will not be altogether new to some members of the council of our society, as Dr. Walker and others were initiated into the secrets, if I may so call them, by which those transparencies, during the last three or four years, and prints upon enamelled glass were produced, that I have had the pleasure of laying before the society. And now, in order that the photographic public may have the benefit of my experiments, so far as they have gone, I have acceded to the request of our secretary to give the details of the process in this paper this evening.

In the session of 1857, I read in a paper to the society the details of a process by which very beautiful positives and transparencies were produced in the camera and by development. Those pictures were named, for want of a better term, vitro-heliographs. Within the last few months this process has been renewed under different titles, some of them more difficult to name than even the above. Very beautiful results, no doubt, may be produced by the process I formerly described, and for some purposes it may still have its advantages; but, strictly speaking, it was not a printing process.

The specimens of my new process upon the table have been printed exactly in the same way that an ordinary plain or albuminized print is produced; only, instead of being printed on an albumen-, they are printed on a collodion-film. The first requisite is the producing of a collodion specially for this purpose. We have always been accustomed with the name of iodized collodion; now we will become familiar with chloridized collodion; and I have no doubt, if it is as answerable for positives as the former has been for negatives, that the commercial and photographic value of this new preparation will be quite as great. After many modifications and trials of nearly all the soluble chlorides, I think that the chloride of cobalt is the best of the many that I have subjected to experiment. 40 grs. of the chloride of cobalt to 1 oz. alcohol gives a definite strength of solution. 2 drachms of the above, added to 6 drachms of plain collodion, gives a chloridized collodion of the strength of 10 grs. to 1 oz. A considerably heavier chloridized collodion may be used, by the strength of the nitrate bath being proportionately increased. Ordinary collodion is what I have used; so there is no necessity for me giving any particular formula for its manufacture. The chlorized collodion seems to have the property of retaining all its qualities for a lengthened period. I had a considerable quantity before I went away to the East, about two years ago, and I found on trial, the other day, that it is as good as it was when it was made. Here is a sample, which, you will see, is of a beautiful blue colour. Now, if we take a sheet of opal glass or patent, plate thoroughly clean it with a little nitric or sulphuric acid, then wash with water, and without drying pour over its surface a quantity of albumen diluted with ten times its bulk of water, containing 3 grs. of chloride of ammonia to each ounce, and allow it to dry spontaneously or by artificial heat. Any number of these may be prepared and kept in stock.

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* Read at the Photographic Society of Scotland, and reported in the Society's Journal.

To make the plate ready for printing, collodionize it with the chloridized collodion in the same manner as an ordinary collodion plate; when set, it is dipped in a nitrate of silver bath, 40 grs. to 1 oz. water, rather strongly acidulated with citric acid. When the plate is thoroughly free from greasy streaks, drain it, and then thoroughly wash it under the tap. It is better, however, to have an arrangement to dry it artificially, if time be of importance. It is now laid on the negative and printed in the usual manner; the time of exposure will be somewhat shorter than that for an albuminized paper print would be from the same negative.

The printing may be examined from time to time, as this can be done without the slightest chance of moving either negative or positive plates, by using the printing-frame I have invented for this purpose.

Here is the frame, and the gentlemen present, by examining it, will see the simplicity of the arrangement, and the accuracy of the results obtained thereby. When the print is fully up, it can be slipped from its position by the point of a penknife; and the toning may be done before or after the fixation in the hyposulphite of soda bath. Of course the toning will only be resorted to, if the colour is wished to be changed. It may sometimes happen that the print may be removed before being fully printed up, for want of time to allow it to be so; in such circumstances, if the plate has not got diffused light before exposure in the printing-frame, all that is required to give it the full intensity is to place it in a bath of pyrogallic, about the strength of two grains to one ounce of water. The picture has to be narrowly watched, and whenever it is fully developed it should be taken and rinsed in water, and can now be toned and fixed, or fixed and toned, as above described. And as it may also sometimes occur that prints which have been fully printed, or thought to be so, may yet, after being fixed, be thought rather deficient in vigour, they also may be brought to any intensity, by being placed in the above-mentioned pyrogallic bath, so that no prints need be lost, but those only which, by accident or neglect, have been thoroughly over-printed. Even these can be turned to a purpose, as they make beautiful transparencies. All the particular effects produced in ordinary printing can be obtained by this process; it is admirably adapted for small lockets, brooches, &c., as the whole grinding and shape of the plates can be effected beforehand, and if the present novelty becomes fashionable of cementing a disc of white glass to the surface, Mr. Forrest will, in all likelihood, manufacture various sizes of ovals of opal with corresponding sizes of white glass for this purpose. But, ultimately, I am in hopes that our watch-dial enamellers will direct their attention to this, and produce plates such as our old daguerreotype plates, having an enamelled instead of a silver surface—this would get quit of the fragility of glass. Perhaps something better than either of these will be produced, especially for the larger-sized pictures—such, perhaps, as thin sheets of vulcanite covered with white enamel; but, of course, whatever preparation may be used, it would require to be impervious to the liquids of our sensitising and fixing baths. I have no doubt that all our fears of want of stability arise from the bibulous structure of our ordinary paper. When this is destroyed by varnishing or waxing the prints, I believe that absolute permanency is secured.

From one particular application of this process I anticipate, in the hands of some of our composition friends, such as Mr. Robinson, some wonderful results. For example, two or three negatives could be used in printing a composite picture on a thin opal glass, as if on paper, but with this advantage, viz., after the picture was finished (which need not be of a large size), a negative could be taken the size or sizes desired, by one of the many amplifying processes, such, indeed, as the one that has produced these beautiful specimens before us. The landscape photographer will also take advantage of this, and, by double printing, give us the beautiful effect of a natural sky—a desideratum that has long been wanted in this department of our beautiful art. See what a charm these small instantaneous views, by Wilson and England, have; and by this process we could have small negatives, say 7 by 5, printed as I have described, and these could be enlarged by three diameters, which would give us a picture 21 by 15 inches.

The picture, by this enlargement, would lose little or none of its original sharpness, and by these means we could reduce the bulky and unwieldy traps which we are forced to carry about with us at present. I believe photo-diaphanie will also receive an impetus from this process, from the ease with which positives can be printed upon polished opal glass, and the readiness with with which they can be removed, in order to ornament vases and other ornamental objects,—all that is necessary being to print the picture as I have already described, only omitting the first application of the thin albumen film, then to pour over the finished print a warm solution of gelatine, and after it is dry (by the bye, it is well to put a few drops of honey into the gelatine, to render it a little more flexible, for, without this, it has a little tendency to crack in the after handling). The surface is now covered with a coating of plain collodion, and, when quite dry, the picture is easily removed by passing a knife round the edge, the film being carefully lifted up. It may now be cut to any form or size that may be required. The collodion coating may be dispensed with, and when so, no varnishing is required to lay down the picture, the surface only requiring to be damped to give it sufficient adhesiveness to adhere to the object to be ornamented. The exposed surface will, of course, have to be protected with a varnish. In order to print on a convex surface, it is necessary to fall back on some other means of printing than our ordinary printing-frame, and to attain this end I cover the frame with a thin sheet of india-rubber. Of course, for this purpose the negative must be removed from the glass, this can be easily done in the same manner as I have described for lifting the positives for photodiaphanie purposes. The lifted negative is now placed upon the surface of the stretched film of india-rubber, and the prepared positive convex plate is now placed in contact with the negative, a continuous pressure being kept up. By the flexible yielding of the negative and india-rubber, the result is a print as perfect as if it had been printed upon a plain surface. By the use of this printing-frame an inequality of surface is a very slight inconvenience. I believe positives for the stereoscope, magic lantern, and for enlargement, will be produced by this process of a quality that has not been attained by any published process that I am aware of, as we have the entire power of modifying or increasing effects as in ordinary printing.

A NEW DEVELOPER.*

BY A. B. CROCKETT.

While experimenting on the qualities of various developing solutions, with the co-operation of Prof. A. E. Verrill, we found that the following combination produced negatives superior in every respect to any other known to us; and deeming it, if of any value whatever, of too much importance to the art to be kept merely for private and secret use, offer it to the public through your columns.

It is remarkable for working with great regularity and certainty, giving peculiar clearness and transparency in the shadows, without undue intensity in the high lights, while the development may be carried to almost any extent, without danger of fogging. The basis of the developer is a mixture of double sulphate of iron and potash, with the double sulphate of iron and ammonia.

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* From the *Philadelphia Photographer*.

But since the first salt cannot ordinarily be obtained from the dealers, its component parts may be added separately, as in the following formula, with which we have obtained, in practice, excellent results:—

Water (pure)	32 ounces
Sulphate of potash	½ ounce
Protosulphate of iron	¾ ,,
Double sulphate of iron and ammonia	1 ,,

To this solution add

Ammonia	2 drops
Acetic acid (No. 8)	2 ounces
Alcohol as required.	

It is best to add the ingredients to the water in the same order in which they stand.

The sulphate of potash should be crystallised and perfectly neutral. It can usually be obtained at ordinary drug stores, sufficiently pure for the purpose.

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ON THE CHLORIZING OF NEGATIVES—A NEW SYSTEM OF REINFORCING.

BY M. CAREY LEA.[*]

The dense metallic silver of which our negatives are for the most part composed, is not in a state favourable for entering into chemical combination. We cannot, for example, convert it directly into sulphide. If we pour a solution of alkaline sulphide over it, the silver is only very superficially attacked; a very thin film of sulphide of silver is indeed formed, but so thin as not to add perceptibly to the opacity of the negative.

We consequently find ourselves obliged, when we desire to strengthen a negative, to employ some substance which attacks silver energetically, and which will bring it into combination even from the dense metallic form. The methods in general use may be divided into two heads.

1. Those which commence by converting the silver into iodide, by the application of iodine, either as alcoholic tincture, aqueous solution, or solution in alkaline iodide.

2. Those which commence by converting the silver into a double salt with mercury, by using corrosive sublimate, either dissolved in water, or in alkaline iodide or bromide.

In some cases, where the negative has been almost strong enough beforehand, some of these processes may at once give strength enough. But more commonly they are followed by treatment with alkaline sulphide or hyposulphite or by ammonia water, respectively, according to the preliminary treatment.

Of these preliminary treatments, that with iodine is unquestionably the best. It is liable, however, to some objections. When the tincture is used, great care is required to secure uniform action, and the iodine rapidly volatilizes, forming irritating and injurious fumes. The washing off is somewhat troublesome, as the application of water instantly precipitates the iodine upon the plate, and this is only gradually redissolved and washed out by the washing water. So that there is always a fear of irregular action upon those portions upon which the precipitate falls. On the other hand, when aqueous and necessarily weak solutions are employed, their action is very slow and tedious.

It is evident that we might employ chlorine just as well as iodine for our preliminary treatment. But solution of chlorine in water is even more disagreeable to manipulate with than solution of iodine, besides the greater trouble of preparation.

It occurred to me that, by availing ourselves of certain compounds of chlorine, the desired object might be attained with a facility far surpassing that of any treatment now in use, and experiment proved this to be the case.

If dilute hydrochloric acid be poured over a negative, the silver is but little affected. The affinity for the chlorine is restrained by the hydrogen with which it is combined. But it seemed evident that if an oxidizing agent were added to the dilute acid, the chlorine would be brought into a form in which it would instantly attack the silver. Either bichromate or chlorate of potash would evidently be the proper substances for this end.

Bichromate of potash, a substance whose services to photography seem endless, and which here appears in an entirely new function, was the substance used, and experiment led to the following proportions:—

Cold saturated solution of bichromate of potash ...	3 fluid drachms
Hydrochloric acid	1 ,, drachm
Water	6 ounces.

This mixture may be kept ready prepared, it keeps perfectly, does not even require to be corked, and has very little smell. It may be poured over the plate, but equal action is best insured by immersing the plate in a bath of it. Still, the pouring answers well. The action is extremely rapid, taking a mere fraction of the time required by the mercury or iodine processes. In fact, the whole matter is so simple, easy, convenient, and effectual, that it leaves nothing to be desired. As in the case of iodine, the first action of the chlorine solution is to darken the plate, before the whitening sets in, and this is best seen by using a very dilute solution, which will work more slowly.

The negative is next to be washed, and the subsequent treatment, whatever that may be intended to be, may be applied. Solution of alkaline sulphide may be poured over, if it is desired to obtain a black plate, or Schlippe's salt in the manner lately described by me, if a scarlet negative is wanted.

In conclusion, I may say that this process seems to deserve to come into general use in all those cases in which a preliminary treatment is wanted before blackening with alkaline sulphide, or reddening with Schlippe's salt.

In a subsequent article in the *Philadelphia Photographer* Mr. Carey Lea makes the following additional remarks on this subject:—

I lately called attention to the advantage of substituting chlorine for iodine, as a means of bringing the metallic silver in negatives into a state permitting of its further alteration for purposes of intensifying. The method consisted in the use of a mixture of bichromate of potash and chlorhydric acid, a mixture which attacks metallic silver with great facility, and converts it into chloride.

Lately I have made some further observations on the use of this substance as a direct intensifier, without the application of further treatment. In my former article, I pointed out that, as in the case of iodine, the first effect of chlorine was to darken the plate, apparently by the production of a basic chloride, after which the change rapidly advanced to the full reaction.

Where it is desired to arrest the action at the dark stage, I find it better to use a weaker solution than I indicated in my former communication, which was for the purpose of complete chlorizing.

Where, then, it is intended not to push the action further than the first stage, the following proportions may be used:

Cold saturated solution of bichromate of potash	3 fluid drachms.
Commercial chlorhydric acid	1 fluid drachm.
Water	20 ounces.

This mixture should not be poured over the plate, but be used as a bath. Even with so dilute a mixture, the action is rapid, and is complete in one or two minutes. If the plate be allowed to lie longer in the bath, it gradually whitens; and this proportion of strength of bath may be very well used, even where it is intended to blacken with alkaline sulphide, or redden with Schlippe's salt.

In these latter cases, however, time is saved by using a solution with only one-half or one-third as much dilution, and in this case, as the reaction is to be pushed to its limit, there is little fear of irregular action, and flowing over the plate is allowable.

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[*] From the *Philadelphia Photographer*.

This method, in either of its two branches, seems to be free from all that is objectionable. The film has no tendency to leave the plate, as when bichloride of mercury is used. Alcoholic solution, with its irregular washing, is not employed, as in the case of tincture of iodine. Nor are we troubled with the long delay which takes place when we use an aqueous solution of iodine,* or a solution of iodine in iodide of potassium. Moreover, I do not know what has been the general experience of photographers as to this last method, but I have found a tendency in the iodide of silver formed, to dissolve in the iodine and iodide of potassium solution, thus causing spottiness and irregularity. In the chlorizing process I have not observed any such tendency.

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ENGRAVING AND OTHER REPRODUCTIVE ART PROCESSES.

BY S. T. DAVENPORT.†

M. Dulos' Capillary Processes.—The last processes to which I have to allude are those recently submitted by M. Dulos to La Société d'Encouragement, Paris, and a full report of which will be found in vol. xi. of the Bulletin of that Society. The report is accompanied by prints illustrative of the results obtained by the methods which he employs, and, as these have not hitherto been published in this country, they will doubtless be read with interest. M. Dulos' process is based on the phenomena of capillary attraction; thus, if lines be traced with varnish on a silver or copper plate with a silver surface, and mercury be poured over it, duly levelled, the mercury will attach itself only to the parts not covered with varnish, and will stand up and form a slightly convex wall on each side of the lines traced on the plate. A similar effect takes place if the experiment be made with a ground glass surface, using water or some other liquid instead of mercury. Take, then, a copper plate with a silvered surface, and transfer or draw upon it, by means of lithographic ink, any design whatever; then cover the plate, by means of the galvanic battery, with a thin film of iron, which, of course will only be deposited on the parts untouched by the ink. The ink is cleared off by means of turpentine, and the plate then presents a surface of iron with the lines of the design in silver. Mercury is then poured on the surface, and it attaches itself only to those portions of the plate which are silvered. The excess of mercury having been removed with a soft brush, the metal remains in relief. From this a mould may be taken, and, by means of the electrotype, a copper plate may be deposited, and this will be an exact copy of the original plate, having the lines in relief. This will serve as a matrix from which intaglio plates may be multiplied to produce impressions in the ordinary way. If plates for surface printing are required, a copper plate receives the design, as before, in lithographic ink, varnish, or other material, and the plate is then, by means of the galvanic battery, coated with a thin film of silver, the film only attaching itself to the parts not drawn upon. The ink is then removed by means of benzine or turpentine, and we thus obtain a plate in which the design appears in copper on a silver plate. The plate is then bitten in by acid, which attacks only the copper lines, the rest of the plate being protected by the surface of silver. The rest of the process proceeds as before. Such are the principles and outlines of M. Dulos' process, which he has now brought into practical working by adopting various modifications and details. Thus he replaces the mercury by an alloy fusible at a low temperature, such as that known as the fusible metal of Arcet, to which he adds a small quantity of mercury. This alloy, when poured over the plate in a melted state, acts precisely as the mercury does, but becomes hard when cold, thus at once forming a plate from which an electrotype copy may be made. This operation, however, must not take place exposed to the air; the plate should be placed under a layer of oil heated to 80° (176° Fahr.), the temperature at which the alloy melts. Oxidation of the surface is thus prevented, which would otherwise injuriously affect the process. Special means are, however, required for removing the excess of either the mercury or the fusible metal, without which the finest lines cannot be retained. An amalgam of copper is found advantageous in the place of either mercury or fusible metal. On the plate, with the design on it, and treated as above, the amalgam is applied by means of a roller of silvered copper, which takes up all the amalgam lying free on the iron surface, and transfers it to the silvered portion. As soon as the amalgam sets, an electrotype copy can be taken. M. Dulos suggests another modification, which depends on the property of silver to attach itself more easily to mercury than copper does, and the following is the mode proposed:—After having drawn the design on a copper plate with lithographic ink, the plate is silvered, and the ink washed away as before. If the plate be now plunged into a bath composed of a salt of mercury, say the sulphate, a chemical reaction takes place, by which the mercury becomes deposited on the silvered portion and the sulphuric acid attacks the coppered portion or lines of the drawing. This operation, which lasts only a few minutes, forms lines in the copper, the sides of which are preserved by the transfer of the mercury from the copper to the silver. There is no more difficulty in drawing on the copper with the lithographic ink than on stone; and a drawing made in this way can be transformed into an intaglio, or surface plate, as may be required.

The following is a *resumé* of the processes used by M. Dulos:—

Intaglio Plate.—The plate, drawn upon in the manner described, receives a coating of iron by means of the battery; the ink is then washed off, and it then receives, by means of the battery, a deposit of silver, which will only take place on the parts not covered with iron, *i.e.*, the parts drawn with the ink. A silvered copper roller, covered with amalgam of copper, is then applied to the surface of the plate. The amalgam attaches itself solely to those portions of the plate which are silvered, and leaves the iron uncovered. As soon as it solidifies, an electrotype plate can be taken from it in copper, which is ready for the press.

Surface-Printing.—The plate, and the design on it, as before, has a layer of silver deposited on it. The ink is then washed off, exposing the lines in copper, which then is oxydised by heating the plate. The silvered roller with the amalgam is then applied, and the amalgam attaches itself only to the silvered portion of the plate; and, on its becoming solidified, an electrotype copy is taken, which, of course, produces the lines of the drawing in relief, and a surface-printing block is thus produced, ready for the press.

Intaglio Plate.—This plate may be produced by using a salt of mercury instead of the amalgam. The plate with its design is silvered, and the ink is washed off as before; it is plunged into a bath of an ammoniacal sulphate of mercury, and whilst there the silvered roller is passed over its surface for four or five minutes. The mercury, by a chemical reaction, is precipitated on the silvered portion, and the plate is at once ready for printing from.

Surface-Printing.—A salt of mercury may also be used for this process; thus, the plate is drawn upon, coated with iron, washed and silvered as before, and is deprived of the iron by means of acidulated water. It is then plunged in the ammoniacal sulphate bath, and whilst there, it is rolled for four or five minutes; the lines of the drawing are at once formed in relief. The plates thus formed may be at once placed in the printer's hands.

Aquatint.—The ordinary aquatint grain having been given to a copper-plate, a copper-plate in reverse is taken from it by the electrotype process. This plate is then silvered, and the drawing is made on it with the lithographic ink, the whites or high lights being produced by the scraper. A layer of iron is then deposited, and the ink washed away as before, and the roller with copper amalgam applied. From this, an electrotype plate is made for printing, the hollows of which reproduce the original aquatint grain, the drawing, and high lights produced by the scraper. M. Dulos describes also another process, both for copper-plate and surface-printing, in which he uses a white varnish (*vernis blanc*). The plate is covered with a varnish formed of caoutchouc and zinc white, which is readily cut through either with a quill pen or an ivory point, with which the design is traced on it. It is then plunged into the iron bath, and a thin film becomes deposited on the lines thus cut. If an intaglio plate be desired, the varnish is then washed off, by means of a solvent, and the plate silvered, the silver only attaching to the copper surface, and not to the iron forming the design. The iron is then dissolved off the plate with diluted sulphuric acid, and the plate is treated with the mercurial salt as before. If a surface plate is desired, then the depositing the iron and silver is reversed. The copper amalgam may also be used if desired.

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* I have seen it lately asserted that iodine is insoluble in water, and this in a photographic publication. I presume that most photographers have dropped tincture of iodine into water, and used or noticed the sherry-wine-coloured solution which results. Authorities differ very much as to the amount of this solubility, thus:

Soluble in 7000 parts, Gay-Lussac.
,, 3800 ,, at 15° C., Otto's Lehrbuch.
,, 500 ,, at 20° C., Jacquemain.
,, 7196.4 ,, at 18.75° C., Abl.

See Storer's Solubilities, from which the above is taken. Jacquemain's statement is evidently wrong, and is probably a misprint for 5000. Even admitting this, the discrepancy is very remarkable.

† Continued from p. 178.

My object in writing this paper will have been attained if I have succeeded in showing the relation of the various art processes to each other. I have endeavoured to point out how each succeeding process has aimed at facilitating the means of reproducing and giving permanence to art, and a larger commercial product at a smaller cost to the producer, and consequent advantage to the public. I have further endeavoured to show the methods which have been introduced, and the attempts which have been made to obtain more readily a true interpretation of the artist's conception, and nature's imprint of itself by means of a combination of lithography, photography, electricity, magnetism, and electrotypes, nature prints, and the amalgam of metals. Each process has been applied in the attempt to produce a surface-block from which to print. Hitherto, a commercial success has not been attained to, and my hope is, that a knowledge of what has been done may cause others to carry on the investigation of this subject to a successful issue.

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ON INTENSIFYING NEGATIVES.

BY W. H. SHERMAN.*

In my practice I always have at hand a bottle of the sulphide of potassium, to use as occasion requires: for I frequently find that negatives, which after development appear sufficiently intense, do not, after fixing, present in the high lights quite the requisite degree of opacity for printing purposes. If, now, a weak solution of sulphide (1 oz. to a pint of water) be poured over the plate, the colour of the lights will be changed from grey to black. If carefully performed the change will be in the *colour only*, without any perceptible thickening in the middle shades, giving the negative better printing qualities.

But it often happens in copying and enlarging daguerreotypes and ambrotypes, and in copying engravings, that a much greater degree of intensity is required than can be produced under the developer. This I have found to be easily effected by the use of the *iron developer* in conjunction with the sulphide of potassium.

After fixing and washing, pour some of the developer over the plate, and let it remain one or two minutes; then wash the plate *evenly* but not quite *thoroughly*, after which apply the sulphide. Pour back into the bottle and examine by holding to the light, and repeat *ad libitum*. If this will not answer, wash off the sulphide, as directed for the iron, and apply the developer the second time, and repeat with the sulphide until the lights are as opaque and black as desired. The more of the developer there is on the plate when applying the sulphide, the more violent will be the action, and in consequence, the greater liability to streak. On the other hand, it will be found that by first applying the developer after fixing, and then washing it off thoroughly, the liability to streak will be removed, and a beautiful uniformity of action will be the result. As a rule, I should say, that a *fully exposed* negative which is lacking in vigour, may be strengthened in this way better than in any other, and that an under-exposed negative, or one with just the right exposure, may be strengthened best with the pyrogallic re-developer.

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* From the *American Journal of Photography.*

Correspondence.

PORTRAITURE.

Sir,—In reading the sentiments of the Rev. A. Taylor, in a recent number of the Photographic News, I was much pleased to find the public are now become alive to the interesting and important consideration in a portrait expression; the photographer who has decided on practising in this department of the profession, has chosen to himself the highest and most difficult, because he has to do with "conscious intelligence," and, therefore, aims at a higher mark than is connected with the other branches of the art, which have no connection with this immaterial principle, and requires qualifications distinctly suited to the variety of persons with whom he is continually brought in contact. I do not mean to say that artists who have shown us by the fineness of their taste the choicest collection of photographic renderings of the material universe, they may not also have versatility of talent, qualifying them to call out of an individual a life-like expression. But this rule is not general or imperative, as there are many photographers of the material world who would never make a good portraitist in the true sense, *i.e.*, possessing the capabilities necessary for producing life-like expression. These remarks are not intended to wound the feelings of any of my brethren in the art (as we are all workers together, only in different departments); but my only intention in expressing myself is to elucidate the subject of "expression," and the qualifications men ought to possess so as to be enabled to accomplish so desirable an end. Many men have mistaken their place, as is evident by the vile productions which are to be seen. Artists will, I am sure, be glad to see that the public are thirsting for an expression of chaarcteristics of mind, and to give effect to this requirement they will very soon find themselves associated only with men of acknowledged talent; and those whose base productions are a blot to our beauteous art must become extinct, or take refuge among the vulgar.

The Rev. A. Taylor says, "give us expression, and we will be content," as it is "the expression we know and recognize;" this is true, and must demand the serious attention of all photographers whose aim must be to produce life-like expression, which, I admit, is not so easily acquired, requiring in the operator a distinct qualification, which resolves itself into the sublime subject of spiritual affinities. Many men may have the ability to manipulate well who cannot produce a good expression, many also can produce an effect on the person who could not excel in the manipulatory details. We therefore see that the class of men for portrait photography must be those gifted with qualities of mind able to easily comprehend the tone both of mind and temperament in all its variety and quality which will be daily presented before them in this experience, and by this thorough knowledge of human nature deal with it in all most pleasing associations. The Rev. A. Taylor has well pointed out the difficulties, and offered suggestions as to the remedy he suggests, a "fair featured woman with the gift of graceful conversation." I am opposed to any person talking to the patient who is not engaged in the taking, as after the conversation is stopped the link is broken, and the expression lost. My way of acting is in every case on scientific principles; the moment I see a person I form an idea of his character, and proceed in my style and conversation, suiting the temperament and organization as index to character. I do not go out of sight of the individual, but keep up a conversation and make arrangements during the whole period. My assistant prepares the plate and takes the picture without speaking; the effect produced by continued conversation with sitters makes them feel at home and pleased, and more so when they, to their surprise, find they are taken almost without feeling sensible of the fact.

"It is the expression we know," truly said, because it is a spiritual manifestation through the physical organization. Man, as matter only, has no happy expression—deprive him of life and his comeliness is gone.

What more lovely than the laugh of a healthy infant, that by its guileless loveliness wins caresses for itself, and makes the mother forget her pain and toil. She is, by this winning child taken captive, and her mind engrossed with his spontaneous flow of interesting qualities. Contrast this with an old gentleman fond of life, petulant and crusty, on whom a loving wife and children have been for years trying their most captivating caresses without effect, causing the old gentleman to be excited, making him exclaim "Bah! nonsense, the old man is not going to die yet, although you think so," it is in vain for them to plead an excuse for this charge, or ask again, as it always puts him out of temper. They have instead, however, brought him to see the portrait of an old friend, the operator is quietly appealed to to do his best, and try the gentleman to have his portrait taken, and if the operator possess the knowledge of physiognomy and character, which he ought, he is thereby enabled to comprehend the spirit of the man, he has this advantage knowing how, and what to say, so as to be interesting. Having commenced speaking in a mode suited to the mind of the man, who will gradually become engrossed in the subject, and next interested with the speaker himself, then is the time for the use of a little tact, which will give you the opportunity to take him in his happy mood, to the great delight of his friends, who will not fail to heap thanks on the photographer, and will send all their friends to the man possessing the talent of knowing how to hit on the most pleasing characteristic of mind. Between these two subjects, the infant and old man, there are subjects possessing innumerable degrees of quantity of mind and organization, on which it is possible to continually write, but they are studies which daily present themselves, and which make the operation, of a busy day interesting, and instructive, and by a continual application in the study of human nature. Photographers will find how to become distinguished for producing on a blank surface the pleasing characteristics of any person. It is necessary that the operator should be gifted with, or cultivate affability of manner, a kind disposition, fluency of speech becoming a gentleman, ease of deportment, composure and serenity under trying circumstances, so that, if failure ensue through the movement of persons sitting or standing, never to chide by word or look, but encourage them to do better next time, which they surely will, and afterwards express themselves very much obliged for having given so much trouble, bidding you a very good day.

It will therefore be seen that photography requires men possessing quantities of mind and temperament, elevated in tone and practice, with the power of language to be interesting; the first-named to give fineness of feeling, the next the power of carrying out plans conceived, and the last—language—as the conveyancer of thought. The public now cultivated in taste, are enlightened as to the necessity of supporting men only of this class, we therefore hope soon to be relieved the pain of witnessing such horrid photographic caricatures of our fellow-men, and humiliating spectacles by persons calling themselves photographic artists.—From yours faithfully, John E. Palmer.

RESTORING INERT TONING BATHS.

Sir,—I take the liberty of sending you a method of recovering gold toning baths, which I have found useful when the chloride of lime bath is used. Should it not be generally known, you are welcome to make it so in your journal.

The old toning baths deposit gold usually in the form of a purple precipitate. If this be collected and shaken up with water made slightly acid, the gold may all be dissolved out by the addition of a solution of hypochlorite of lime—the ordinary bleaching powder. It is well to heat the liquid to the boiling point, to get a complete action, and also to destroy any excess of hypochlorite. The hypochlorite solution and the acid may be added little by little until the solution be complete, and thus any large excess is avoided; but I have not found an excess objectionable if well boiled.

The solution, when neutralized by chalk, and filtered, is of a clear yellow colour, and is ready for use as soon as cold. I find it give excellent tones, and that the prints do not lose as much depth in it as in an ordinary chloride of lime bath: in fact, they lose next to none.

The solution thus made contains chloride of calcium and nitrate of lime, and possibly chlorate also.

Hypochlorite of lime, or any other salt, may be added, but I find none needful.

By the same method the deposit adhering to bottles or baths may be cleaned off and recovered—using hot water, acid, and bleaching powder.—I remain, yours obediently,

Philip J. Worsley.

THE PANTASCOPIC CAMERA.

Sir,—I must again trespass on your indulgence, for space to reply to the letter of "Architecton," in your last number. I must be permitted to express my extreme surprise, that a gentleman whose delicate sense of propriety could see personality in the letter of Mr. Le Neve Foster, should descend to the tone of his last communication.

Cannot he perceive that, even if I were the vain egotist he represents, yet his geometry is not rendered thereby less incorrect?—that, if it were literally true, that I bawled out the superiority of my wares at a shop door, yet the ratio of the diameter of a circle to its semi-circumference is not as 12 : 20, as any schoolboy knows; and that his diagram No. 3 still remains a gross distortion of the real fact?

As "Architecton" evidently wishes to escape from the serious errors of his first letter under the personality of his last, allow me to recapitulate the points at issue between us.

1. It has never been asserted by anyone interested in the pantascopic camera that the views are in plane perspective, or are absolutely true when viewed flat. Every view published has the fact of its being a panoramic view engraved upon it. Every statement, public or private, relating to the pantascopic camera, has testified to the same effect. It would be an insult to common sense to assert the contrary. If the camera can take in a view of the whole horizon, how can the perspective be plane? The object of "Architecton's" first letter was not, therefore, to correct any statement put forth by me or my friends.

2. As all the views published are of 120°, or less, and as the cameras offered for sale are for the same angle, or less, the figures given by "Architecton," relating to an angle of 180°, are three times too great.

3. In giving the figures relating to this "extreme" angle, "Architecton" perverted them. They are not as 12 : 20, but considerably less, the exaggeration being about 14 per cent.

4. In giving a graphic representation of the erroneous dimensions of this extreme angle, "Architecton" grossly distorted the details in his 3rd diagram.

I call upon "Architecton" whether, as a man of honour, really desirous, as he stated in his first letter, of "justice to all parties, vendor or purchaser, intending or actual," or as a man of science, desirous of truth, to justify these figures and diagrams, or to correct them. If he wishes to discuss a hypothetical case, of what the instrument might or could do, by all means let him do so, but let it be stated to be hypothetical, and let him show what would be the nature of the representation of the assumed case in plane perspective. "Architecton" knows, or ought to know, that in the case he has selected, 180°, his attempts to do this would result in a complete absurdity, as no plane perspective view of 180° is possible.

I accept his lesson on undue self applause. As he truly says, it is a weakness common to humanity in all ages. But is he exempt from this infirmity? He has assumed the position of a judge, to determine "what benefit there might be to the heliographic art" in an invention to which the author has given some years of conscientious labour, and for which he has made much pecuniary sacrifice. Is he sure that he possesses the qualifications for the performance of the functions thus self-imposed? Has he a complete knowledge of the thing criticised? Has he the necessary impartiality?—Is he free from bias—uncommitted by previous statement? Has he the requisite scientific knowledge, and habitual accuracy of statement? Has he temper, moderation, and sense of justice, to sustain his judgment, if called in question, or to correct it, if proved erroneous?

I must be pardoned, if I believe that he has greatly overrated his powers. I doubt his knowledge of the thing judged, when he gives elaborate diagrams to prove that the pantascopic views are not in plane perspective—for no one has asserted this. While his figures and diagrams are uncorrected, I doubt his impartiality and sense of justice. The statement that the diameter of a circle is to the semi-circumference as 12 to 20, and the confusion of terms as to a polygon and a polygonal prism, cause me to doubt his accuracy, and with the personality of his last communication before me, I call in question his temper and moderation.—I am, Sir, Yours, &c. J. R. Johnson.

Photographic Notes and Queries.

On the Use of a Bromide after Development and before fixing a Landscape.

Sir,—I find it is very advantageous, before using the hyposulphite of soda, and after the development of a plate is ended, and the plate is gently and sufficiently washed, to flush the plate with an eight-grain solution of any bromide. It very satisfactorily disposes of any free nitrate of silver on the surface. If this is disadvantageous, I should be instructed if I knew the disadvantages: if it is advantageous, of course many persons have practised it. It seems to me to be an improvement on the usual course. C. C.

The "Eburneum" Process.

Sir,—I find in the Photographic News, April 21st, "We have not worked the 'Eburneum' process ourselves, nor had communication with anyone, but the inventor, who has."

Such being the case, it may possibly interest others besides "W" to know a little more about it. It is quite true that "neat manipulation and care will be required," (and I heartily wish the public had not only "required," but *enforced* the same years back), but that "success *must* follow" (the italics are mine) is a statement open to doubt. I am willing to concede that the inventor of the process has expended a vast amount of time in working up the same; but at the same time, in all impartiality, I believe he has *advanced backwards*.

Photographers as a body have been striving for years past for absolute permanency, and it is in this respect that *theoretically* I believe the process fails, *practically* it, of course, can only be solved by time. The specimen sent me by the inventor, and those produced by myself, having one and all the following peculiarity,—that in *damp* weather one might roll them tightly round a lead pencil without fear of injury, whereas in *dry* weather they become as brittle, and are as easily broken, as a piece of glue of equal thickness, and while, on the one hand, I cannot quite see the necessity of *boiling* either ordinary negatives or "Eburneum" positives (they are both collodion films, so I presume your contemporary would expect them both to stand *boiling*); on the other hand, unless this atmospheric action can be *thoroughly* overcome, we believe no guarantee of its permanence can be given.—Yours respectfully, One who has paid his Two Guineas.

[We have found the specimens in our possession affected slightly of damp; but not in the degree described by our correspondent. We shall be glad to hear from Mr. Burgess on the subject.—Ed.]

Talk in the Studio.

Non-actinic Glass.—We learn, from the *American Journal of Photography*, in some recent experiments on the power of glass of different colours to transmit actinic light, made by Mr. Johnson, in New York, that ruby glass, coloured with copper, was least actinic.

Enlargements without Development.—Mr. Solomon has called our attention to some remarkably fine specimens of direct enlargement, on albuminized paper, both in portraiture and landscape. The difficulty in getting satisfactory tones, crispness, and brilliancy by development, and the uncertainty of sunshine for direct printing in this country, has suggested the desirability of an establishment for enlargement in a better climate. M. Rolloy has, therefore, it seems, opened an establishment in the south of France, at Hyeres, where good sunlight is continuous, with little exception, throughout the year. Dr. Van Monckhoven's camera is adopted, and has been fitted and arranged under his own superintendence. Mr. Solomon is agent for this country, and will arrange to send off negatives every Wednesday, guaranteeing the return with prints in twelve days. Of course with the best enlarging appliances good prints cannot be obtained without good negatives; but if customers can receive prints anything like those of which we saw some dozens at Mr. Solomon's, the demand for enlargements will become much more general, and the supply more satisfactory than it has in many instances yet been.

Field Camera.—Mr. E. Aldis has recently called our attention to an ingeniously contrived camera for the field, to which a convenient hood may be very easily attached, so as to change dry plates from a box into the dark slide, and a variety of other manipulations in the dark, can be effected in the field. The camera has also a shutter inside, just behind the lenses, which may be used for instantaneous exposures, or so managed as to shut off the sky during part of the exposure. The contrivance generally seemed light and convenient

Keeping Collodio-chloride of Silver.—Mr. Swan has adopted a very neat method of protecting collodio-chloride of silver from the action of light. He encases the bottle in tinfoil, which effectually excludes light, and does not make the bottle clumsy to handle.

Photographic Enamels.—Mr. Joubert, whose process of photographic enamelling our readers are familiar with, has recently made some important improvements, by which his enamels, formerly intended chiefly as transparencies, are available as pictures by reflected light. On Wednesday the private view was held of an exhibition of some very charming specimens of his latest improvements. We shall have more to say on the subject in our next.

The New Printing Process.—Mr. Walter Woodbury has sent us some further specimens of the new printing process, whereby photographic half-tone is secured in impressions obtained by a printing press. These are of a much larger size than any we have yet seen, and are very perfect and well-defined. Mr. Woodbury informs us that he has found the method of obtaining a metal plate in intaglio by electrotype, from a gelatine mould liable to several objections, and he has devised another which promises to be perfectly successful. The method by which the metal intaglio is now to be secured is by placing a plate of lead, or other soft metal, on the gelatine mould, submitting both to great pressure between two perfectly true surfaces. We are glad to see progress in what, we believe, will be one of the most important printing processes yet discovered. Mr. Swan recently sent us some examples of his work in the same direction, a card portrait of a lady, rendering silk drapery, by the new process, very beautifully. We regret to see that some misunderstanding has arisen between Mr. Swan and Mr. Woodbury on the origin of this discovery. As we know both gentlemen to have been, beyond question or cavil, independent and original inventors in the matter, we are sorry to see any misunderstanding between two able and estimable men.

To Correspondents.

⁂ **The Misses Bertolacci's Reproductions.**—We notice in a letter in the Photographic Notes that Miss C. Bertolacci complains somewhat bitterly that the reproductions of herself and sister have been "ignored," that is not noticed, in the Photographic News. We should be sorry to say one word which might appear uncourteous or painful to two very estimable young ladies; but we must remind them that it is the critics duty to review justly such productions as are brought under his notice; but it is no part of his duty to notice every photograph which is published whether it is forwarded for review or not; in fact the task would be hopeless if attempted. With the exception of a few copies of the engravings of the *Liber Studiorum* shewn at one of the exhibitions two or three years ago, and which were probably the early attempts of these ladies, we have not seen their work. It is a great error too, to suppose that our recent articles on reproduction are the "first to suggest these artistic reproductions." We have advocated for years the cultivation in a much greater degree than at present, of the art of photographic reproduction; and that art has from the commencement of photography been more or less practised.

Stradbroke.—The injury you describe which appeared, on applying the varnish, was doubtless due to a partial solution of the collodion film by the varnish. This will sometimes happen with new collodion if made of a certain kind of pyroxyline, but it is still more common with old collodion in which decomposition has commenced. The use of bromide of cadmium, at the rate of from half a grain to a grain to an ounce, is sometimes useful in partially restoring the sensitiveness of old collodion, but it would not render it less liable to be dissolved by the varnish. The best remedy for that is the application to the film before drying of a dilute solution of gum water, 10 or 15 grains to the ounce. This will protect the film from the solvent action of the varnish when applied.

J. Carus Crofton.—Your letter duly received last week, remained under consideration. As Mr. Pouncey's letter to which it is an answer did not appear in our pages, we must decline to insert yours, as we have no desire to open out again a controversy of which the photographic world has had far more than enough, and which leads to no good end.

Nassau Jocelyn.—The illustration you enclose of an unsatisfactory print from a good negative is interesting. We can readily believe that, in many respects, the negative is very perfect, but still it seems probable to us, that the defects in the print are really due to the negative, although possibly a somewhat more vigorous print might be a better picture. One cause of the flatness of which you complain appears to be due to the lighting. The light falls too directly on the front of the subject forming the picture. The best kind of light for getting a relieved and artistic picture is a side light forming an angle of about 60°, with the line between the lens and the landscape. The definition is not quite satisfactory. What aperture did you use with the lens?

N. B. McGregor.—Neither of the firms you mention are makers, but dealers; but both are respectable, and will probably supply you with a good instrument. 2. Mr. Tulley, who was, we believe, the first to propose the addition of cyanide to the nitrate bath, merely filters afterwards, but we should prefer sunning as well. 3. You will find a description of the most convenient developing box we know on p. 458 of our 7th volume. (No. 264.)

J. McDougal.—In stating that the iodized varnish should not remain long on the picture, Mr. Hughes meant that it should be poured over the plate, and off again, quickly, as in varnishing in the usual way, as, if it were allowed to remain long on the film, too much action might take place. Once doing will be sufficient for always—no repetition will be necessary.

G. G. W. H.—Decidedly let your side light face north if you can. 2. The steam and smoke from railway engines, at a distance of 70 yards, will not be very injurious. The glass in the side facing north should be plain, not ground. 3. You will find that one side of many samples of glass is smooth, whilst the other is rough, with little excrescences. Always coat the smooth side. When business matters are contained in letters to the Editor, they sometimes cause delay in attending to one part or both.

Inquisitor.—We have seen full-length portraits, *carte de visite* size, both with plain and pictorial backgrounds, which were taken by Dr. Diamond, as early as 1852. The introduction of card portraits as a matter of trade did not take place until some years after that. We believe they were introduced by Disderi, of Paris, about 1859, and were adopted in this country immediately after.

Goose.—The specimens you enclose unquestionably prove that there is a fault somewhere. The first thing to discover is where the fault exists. The place of the ground glass and that of the sensitive plate coinciding to less than the 32nd of an inch, is not nearly sufficient. They must exactly coincide, without half a hair's breadth of difference. The difference of the 32nd part of an inch in the positions of the ground glass and sensitive plate might easily throw the focus a foot out at the place of the sitter. It is a somewhat difficult thing to measure the distance sufficiently accurately with a rule, and therefore it is important to adopt a more certain and simple plan. Proceed as follows:—Focus very carefully, on some object which will readily show the definition, on the ground glass; then place a piece of ground glass in the dark slide in the place which would be occupied by the sensitive plate, lifting up the slide, and opening the back so as to permit the image to be examined on the ground glass, which should be as sharp as it appeared on the focussing screen. If it is not so, the two do not occupy the same plane, and a correction must be made. If you fail in satisfying yourself on the subject, the best plan will be to send the camera and lens to the maker of the latter, who will, doubtless, test and rectify the matter for you. 2. Opaque spots in the film are often the result of some turbidity in the collodion, which will disappear after perfect subsidence. Streaks, in the direction of the dip, may at times be removed by allowing the plate to remain out of the bath until the film has set well, and also by the plan of moving the plate the moment it is plunged in the bath. The general photography of your cards is good. In No. 2, the negative wants more intensity, a little tincture of iodine or iodized varnish would probably improve it. No. 3 is the best picture, but a little directly full face. Your lighting and printing seem good. The spots in No. 10 are due to metallic spots in the paper. If you have space for the lens of longer focus, we should prefer it. The snowy effect in stereoscopic pictures is due to two causes—partly to slight hardness or over-intensification in the negative, and partly to the texture of the paper on which they are printed, being magnified by the lenses of the stereoscope. Glass pictures rarely show the same defect. We do not quite understand by the mistiness in stereographs to what you refer.

W. S.—To be strictly theoretically correct the lenses of a binocular stereo camera should be the same distance apart as the human eyes, which is on an average 2¾ inches. It is customary, however, when using the ordinary plates, which are 6¾ inches long, to place the lenses 3 3-8ths from centre to centre. We use a front which admits of some lateral movement. 2. The peculiarity of the quick-acting single lenses is that good definition may be obtained with a larger stop than can be employed with the ordinary construction. They will, we believe, answer as well for all purposes, and better where great rapidity is required.

R. G. C.—In the few experiments we have made for transferring a film of gelatine from glass to paper, we had not had much difficulty; but our experience is not so extended as to enable us to say certainly the cause of your difficulty. It is a process regularly practised by those who coat pictures for bon-bon boxes, and we believe failure is unknown to them. It is probable that the solution of wax in ether will answer best, and as for the surface it gives, it is not of the slightest consequence, as that surface does not form the surface of the finished picture. In fact, if the pigmented gelatine were applied to the paper with a brush, or by floating, so long as a moderately even coating were obtained, it would answer as well as when applied to glass, and transferred to paper. 2. We have occasionally met with pin-holes from intensifying, but only when the intensifying has required to be pushed very far, and we have always suspected that the defect had existed in an incipient state in the original negative, and was only rendered more apparent by intensifying. You do not state whether the intensifying is effected before or after fixing. That is a matter which might aid in determining the cause. You may rest satisfied that the lens has nothing to do with it. The defect arises either from some imperfection in the condition of the chemicals or in the manipulation. A perfectly clean bath free from excess of iodide and from dust; and a collodion, exposure and development, giving nearly sufficient intensity in the first process, without much intensifying, will most likely prove the best remedies.

A Novice in Trouble.—There should be no reason why the lady, whose portrait you enclose, should not make a charming portrait. The chief fault in the negative, a print of which you enclose, is want of intensity; and from the silvery white character of the image you obtain, it would seem as if your nitrate bath contained an excess of nitric acid. Try a little shorter exposure, and prolonged development. The face ought to be in a more brilliant light. If these remedies fail, try another sample of collodion.

C. G. (Beverley.)—You will find it of vital importance in printing by development to preserve the paper from the slightest possible action of white light, as that is a sure source of imperfect whites. We can see no reason for the stains, mottling, &c., but want of perfect preparation of the paper, either in iodizing, or silvering, or developing. The paper you are using does not seem of a quality suited to the purpose. With a solar camera and bright sunlight, a few seconds' exposure are generally sufficient. Are you certain that you are using a sufficiently strong silver solution? The prints suggest poverty of silver. If we can help you on any specific point, do not hesitate to ask us. We regret that, in a case like this, in which you use a process, you believe carefully in all its details, which should give good results, but which really gives bad ones, it is difficult to afford efficient help.

Medicus.—You may use three cameo portraits without infringing the design of Messrs. Window and Bridge, for the Diamond Cameos.

Inquirendo.—We know nothing of the gentleman to whom you refer, nor of the press.

H. B. of K.—A condenser of 5½ inches diameter is too small for a solar camera. About 9 inches diameter, and 18 inches focus, will be much better. We cannot tell you where to procure one. Mr. Atkinson, of Liverpool, is a manufacturer of solar cameras. That is the best instrument for your purpose, and possibly you can buy it as cheap as you can make it.

Dilemma.—The presence of iodide of silver in a printing bath is generally found injurious, retarding toning, and rendering the prints less brilliant. It is somewhat a difficult process to remove it, but you may try one or two plans. You may dilute the bath with an equal bulk of water, and then boil it, filtering whilst hot, and subsequently make it the proper strength again; or make it alkaline with ammonia, then add sufficient of a solution of citric acid to cause a precipitate of citrate of silver, which will carry down with it the bulk of the iodide of silver. If, when the operation is completed, it remain acid, add sufficient ammonia to neutralize.

Moist Plates.—The plate is to be surface washed from free nitrate before applying the preservative.

H. Y. K.—If our correspondent will favour us with the address at which a letter will reach her, we will send the information by Post.

Peter Collins.—We will write.

Several Correspondents in our next.

Registrations have been duly attended to, and will be specified next week

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All Communications for the Editor to be addressed to
82, Paternoster Row.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 348.—*May* 5, 1865.

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NEW SENSITIZING AGENTS.—INPORTANT DISCOVERIES.

We invite the attention of our scientific readers to a most important communication by our esteemed contributor and confrere Dr. Vogel, which will be found on another page, in which he details some experiments leading to a discovery of the utmost practical importance and value. The part played by free nitrate of silver, in rendering iodide of silver sensitive to light has been the subject of much speculation and discussion, but no certain theory on the subject has been established. The researches of Dr. Vogel who has been, as our readers know for some years past, engaged in this enquiry, have at length been crowned by a discovery, satisfactory in theory, and which is likely to lead to most important practical results.

It was well-known that iodide of silver precipitated with excess of iodide of potassium was insensitive to light, whilst that which contained a trace of nitrate of silver in excess was highly sensitive to light; but the rationale of these conditions was unknown; nor was it at all elucidated by the discovery of Poitevin that tannin might be made to supply the place of nitrate as a sensitizer. In regard to chloride of silver, the matter was less difficult. It was known and recognized that the action of light set chlorine free, separating the salt into chlorine and metallic silver according to one set of theorists, and into chlorine and protochloride of silver according to others. The same of bromide of silver. But with the sensitive iodide of silver no trace of iodide could be found liberated after the action of light. Here was the difficulty, and this difficulty Dr. Vogel has now satisfactorily solve.

From the discoveries just completed, it appears that iodide of silver is only sensitive to the action of light in the presence of some substance which readily combines with iodine, and that the office of nitrate of silver is to absorb the iodine as fast as it is liberated by the action of light, and it is in virtue of this action, it renders sensitive the iodide of silver. This fact established, it follows that other substances, which readily absorb or combine with iodine, will also serve as sensitizing agents, in place of nitrate of silver, and that some of them may be capable of application in modes which will give new powers to photography. Further experiment proved that a variety of other substances acted in the same way, and were capable of being substituted for nitrate of silver, in rendering this iodide sensitive to light.

The possible practical results of such a discovery can scarcely be indicated at present: in the preparation of dry plates it is likely to be most valuable. When a principle is established, it leads to much higher results than the discovery of an isolated fact, as it at once indicates systematic progress.

We have now an explanation of many known, but not well understood phenomena. We see *why* tannin acts as a sensitizer; we can understand the part played by M. Piard's arsenite of potassa in dry processes; and some light is thrown on M. Kaiser's experiments with the vapour of benzine, &c., as sensitizing agents.

It is not impossible that dry-plate photography may, through the facilities rendered available by this discovery, inaugurate a new era, in which it shall entirely supersede wet processes.

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THE PHOTOGRAPHIC EXHIBITION.

The Eleventh Annual Exhibition of the Photographic Society is now open to the public, in the Architectural Gallery, Conduit Street, Regent Street. After a decision that, owing to the heavy loss entailed upon the Society by the exhibitions of the last few years, no public display of photography should be invited for this year, a way was found to minimize the risk to such an insignificant sum as to be not worth consideration compared with the great advantage to the art undoubtedly secured by a periodical public illustration of its progress. At the eleventh hour therefore, it was resolved that an Exhibition should be held, and a hasty notice to contributors was sent out, which has met with a response, far exceeding, in the excellence and the number of the pictures sent in, anything which might have been anticipated by the most sanguine imagination.

The walls of a moderate-sized gallery and two sides of a central screen are well covered with excellent pictures. The number of frames is probably about five hundred, but as no catalogue is published, we have no exact information on the subject. The same reason and the scant information furnished on the pictures themselves, precludes our stating with accuracy the relative number of pictures by various processes; but we run no risk in saying that by far the greater proportion are produced by the wet collodion process. Indeed, with the exception of the magnificent pictures of Mr. Mudd by the collodio-albumen process, and some specimens from instantaneous tannin plates by Major Russell, we do not remember any noteworthy specimens of a dry process present. There are examples of various new printing processes, carbon, collodio-chloride, enamel, and photo-lithography; but nothing new in the way of producing negatives.

In the place of honour, and deservedly so, are the contributions in portraiture and artistic composition, of Mr. H. P. Robinson. The only example of combination printing he exhibits is a picture which has been noticed in these pages already, but which has not before been exhibited at an exhibition of the Society; we refer to the "Lady of Shalott." All the readers of Tennyson are familiar with the mystic fragment which records the spell under which this hapless lady lived; how the curse which had hung like the sword of Damocles, came on her, and how at length, on the closing of a dreary autumn day, she glided down to death on the broad stream, which ran between willow-veiled banks to many-towered Camelot. This is the scene which Mr. Robinson has attempted to depict. He has adopted the quaint poetic manner of the pre-Raphaelites in his rendering, and has happily secured the weird feeling and subtle spirit of gloom which pervades the Laureate's poem. The sombre evening effect is heightened by the almost total obscuring of the sky, by the huge willows which o'er-hang the stream, the chief light in the picture being on the white drapery in the figure, and the reflections in the water. The task is a difficult one; but the difficulties are admirably overcome, and the picture is one of rare beauty and power, grandly asserting the pictorial capability of photography. We have seen many paintings illustrating the same poem; but none comparable in artistic power and poetic expression to this photograph.

Mr. Robinson exhibits a small circular composition named "Evening," which especially pleases us. A pretty, modest peasant girl is resting by the way on her return from gleaning; the evening sun illumines half her face and part of her rustic attire. The massing of lights and shadows, the admirable arrangement of lines and general balance of the picture, the perfect softness, combined with the brilliant effect of sunshine, the excellent rendering of a pleasing sentiment—all unite to produce a most charming picture.

The "Welsh Girl" is another exceedingly successful and beautiful rendering of figure photography in broad sunshine, in which the full effect is obtained without loss of delicacy or detail. Amongst examples of art portraiture, few have ever pleased us better than "Brenda," in which a pretty young girl is presented with rare grace and freedom from conventional treatment. The mass of the picture is in shade or deep mezzotint, but the head is well illumined, and becomes the principal light in the picture, which, notwithstanding its low tone, is exceedingly sunny.

A portrait of a gentleman, in the same size, 12 by 10, is also exceedingly fine, delicate, round, and forcible. The background in this is a good illustration of what a pictorial background should be, suggestive, and scarcely made out, rather than loud and prominent. A mass of light which, in both these portraits slants across the picture, giving breadth to the atmosphere, is an admirable illustration of what may be done in producing effects of this kind by the skilful application of the intensifying solution to especial parts of the plate.

A large composition, printed from several negatives by Mr. Twyman, of Ramsgate, entitled, "Our Society," will claim a good deal of attention. We have looked with interest for some successful attempt at combination printing from Mr. Twyman since we saw his clever portrait of Sir Moses Montefiore, in his own home, printed from several negatives. The picture of "Our Society" is a very ambitious one, and the attempt is, in many respects, as successful as it is meritorious. Something like a dozen persons are engaged in musical practice—vocal and instrumental; the expressions and attitudes are admirably rendered, and in the majority of instances, without the slightest appearance of consciousness that they are "under fire," and that the photographer is amongst them. Young and old, vocalists, and instrumentalists, are intent on their practice: we feel that many of them are actually singing; the flautist throws back his head a little to one side, and turns up his eyes as it is ever the wont of the "first flute" to deport himself. The horn is too serious a matter for much gesticulation; it manifestly engages all the energies of the performer, and is with him a grave business. The first fiddle, we beg pardon, *primo violin*, is jaunty and slashing in his style; the second violin, gravely and steadily, gives close attention to his work. And so with all the others; attitude, expression, and photographic management are all excellent. The faults of the picture are, first, a little excessive use of the device of sunning down, which gives the effect of an atmosphere of smoke; and second, a little want of unity in the composition; the figures are a little scattered; there is no principal central group, nor are the various groups, of which the whole is composed, sufficiently massed or united, to form one complete group. We do not, in making these remarks, depreciate the excellent aim, and, in many respects, skilful execution of a very difficult picture, which is highly commendable, and we look forward to still finer results from Mr. Twyman's hands.

Mr. Blanchard, in addition to his charming instantaneous pictures, to which we shall refer again, exhibits some fine studies on twelve by ten plates. A pair consisting of two brides, one a newly married wife, and the other a nun; both are fine, but the latter is especially effective. Two monks form another pair, one the ripe scholar and genial gentleman, and the other the zealot. Massive and daring chiaroscura are here secured, without hardness, and the expression, especially that of the zealot, is rendered with rare felicity. A picture, representing play in the studio, consisting of two pretty children enacting the parts respectively of painter and model; one little one is sitting demurely for a portrait, whilst the other with pencil and mahl stick, stands in front of the easel. In these the expressions are also capital. An excellent portrait of Mr. Blanchard forms another fine picture of the series, which, as a whole, is characterized by great force, breadth, and artistic feeling. His study, entitled "The Trio," is one of the most skilful bits of *genre* photography we have seen: nothing could be finer than the rendering of expression; and the photography is perfect.

Mr. Silas Eastham, of Manchester, sends a 12 by 10 group of two figures, which is well worthy of notice, for good grouping, fine lighting, roundness, delicacy, and general excellence, and especially for fine and peculiar management of the tone, which very nearly resembles that of a very rich and fine Daguerreotype, having all the rosy and pearl-like effect in the half-tones, with which old Daguerreotypists are so familiar.

Mr. James Ross (formerly Ross and Thompson) sends some very clever studies, characterized by very fine photography and skilful management of expression. It is a pity that a good picture like that entitled "Somebody Coming," should have a title borrowed from a well-known picture by Mr. Robinson.

Dr. Hemphill sends some very excellent studies, chiefly of scriptural subjects. They are characterized by fine appreciation of the sentiment of the subjects, great artistic feeling, and fine photography, which, by the way, we may point out as illustrating what may be done by simple iron development, without intensifying.

Mr. H. Cooper, Jun., has a frame of his clever art studies of single subjects, most of them good examples of double printing, although some are a little dark. Mr. Cooper has been especially happy in rendering expression in many of his pictures, which will secure many admirers.

These, so far as we remember, are the chief of the noteworthy pictures which claim attention as figure studies or compositions. Portraiture is not strongly represented; but we shall have occasion to refer to it again. Landscapes form the chief staple of the Exhibition, and we have rarely seen a finer collection. To these we must also refer again.

The medals have, we understand, been awarded: we shall enter more into detail on this subject in our next.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

The Exhibition—Photographic Tourist Club—Mr. Dallmeyer's New Lens—Sailing under false Colours—The rising Generation—Mr. Hughes' Paper—Exaggerated Softness—Mr. Mudd's Dream—Gas v. Magnesium—The Societies.

The fruitfulness of photography was never better exemplified than in the exhibition of the Photographic Society just opened in connection with that of the Architectural Union. After it had been announced in the report of the Society that no exhibition would be held this year, it was suddenly discovered that such a thing was not only possible, but desirable and indispensable. A committee of the council was formed, and went to work with such energy, that although they could scarcely afford a month's notice to photographers, they have got together one of the best collection of photographs ever exhibited under the auspices of the Society. Not one name of eminence, with the exception of those of Thurston Thompson, whose capital reproductions are ill spared, and T. R. Williams, whose charming portraits would add a grace to any exhibition, is absent. Bedford, England, Mudd, Robinson, Blanchard, Thompson, Gordon, Hemphill, and many others send selections from their best works, while the specimens of new processes exhibited are numerous and interesting. The Simpsontype has a prominent position, and is surrounded by specimens of enamel by Lafon de Camarsac, Joubert's new process of photographic enamel on glass, Swan's carbon process, which are, unfortunately, printed rather dark, and Pouncy's prints in printer's ink, and which specimens, by the bye, unfortunately go far to justify all that has been said about the want of success of this much belauded and abused process.

The hanging committee appear to have accomplished their difficult task in the main fairly. There are, of course, a few cases in which the size or shape of the frames had prevented the pictures having so good a place awarded to them as they deserved; the only palpable piece of bad hanging is where a large space on the line is given to a collection of out-of-focus studies, which all photographers must be sorry to admit as specimens of the results of their art. The further off such pictures are from the eye the better, and the valuable space occupied by them might have been more usefully employed. Their prominent position seems to favour the practical joke in which some portions of the critical press have indulged of late by going into pretended, and manifestly-derisive raptures as to the rare qualities of these pictures as art photographs. I do not admire these pictures myself, but I think courtesy to a lady should prevent them being made the subject of burlesque praise, as extreme in its expression, as though the photographs had been produced by the masters whose pictures are supposed to be followed in producing the studies.

The London Photographic Tourist Club held their first meeting at the often photographed "Burnham Beeches," on the 8th of the month. More beautiful photographic weather, it would be impossible to get made to order. A June day occurring in April is a surprise that does not often happen, especially if it be wanted for some great occasion. As it was—

> "A day in April never came more sweet."

And this line reminds me that a sacriligious joker in the company misquoting Shakespere most abominably, said, the "Inane dunces had come to Burnham Wood," which was a very wide shot at "till Burnam Wood remove to Dunsinane." It must be plain to the dullest comprehension, after this, that if the company was small, which it certainly was, that it was a day of thorough enjoyment thoroughly enjoyed.

A month's hard work with Mr. Dallmeyer's new landscape lens, a description of which he read at the last meeting of the Society, has convinced me of its superlative excellence. Several lenses have been introduced for the purpose of including a wider angle than that afforded by the ordinary lens supplied for landscape work; but, in these, width of angle has been attained at the loss of many other qualities a lens should possess. In many of the new lenses, definition can only be gained by the use of a stop so small that lengthy exposure is rendered necessary, and consequently the negatives produced by them are wanting in "pluck," and appear dull and flat. With the new lens a comparatively large stop might be used without loss of definition, while the power it possesses of covering a large field with the largest aperture renders it incomparably the best lens yet suggested for photographing large sun-lighted figures in the open air.

I am sorry to see that photographers sometimes sail under false colours, and exhibit specimens to which they have no claim. At a door in Regent Street is exhibited, amongst other things, a carte of two young ladies, standing in a bower, coloured abominably—and that reminds me I am wrong in accusing them of sailing under false colours, the colouring is their own—which certainly was not taken by the gentleman inside. It must be very annoying to the real producer of the card to see his work smudged over by a scene painter, and put forward as the work of another man. There are other sinners in the same direction. I have noticed photographs of celebrities, taken by a well-known and highly-respected amateur, exhibited as the production of other firms in the same locality.

Photography is becoming old, and is being transmitted from generation to generation, to wit, Mr. Hughes, senior, and Mr. Hughes, junior, have read papers at different societies, on the same evening, during the past month. This is the first time, I believe, that such a "double event" has occurred, with the exception, perhaps, of the case of Messrs. Claudet and Son, the latter of whom has made contributions to photographic literature. It is a somewhat interesting reminiscence in connection with this subject, that Mr. Jabez Hughes read his first paper on photography at any photographic society, at Glasgow; when the photographic association there was first established, Mr. Hughes delivered a magnificent inaugural address. His son commences his public photographic career in the same northern city. I hope he will live to become as useful and as honoured as his father. Mr. Hughes, senior, read a paper at the South London Society, "About light, and about lighting the sitter," &c.

He explained that he had "not had time" to write a short paper, which was to be regretted, seeing that concentration, in lighting, at least, is his hobby, his theory being that the minimum quantity of glass which it is possible to use in building a glass house should be employed. This is beautiful in theory, but it appears to me to be better in practice to have a considerable amount of glass, for the reason that it is possible to cover up the light that is not wanted, but it would be more difficult to open spaces that have been bricked up to admit light on dull days.

His paper, long as it was, was certainly not dull, being illustrated with quiet humour and brilliant wit, anecdotes and jokes, some good, some original, and some, perhaps, profane—for all of which qualities, if it did not for its intrinsic merit, it will find many readers.

While on the subject of lighting the sitter, I must enter a protest against the desire for exaggerated "softness" to which many of our photographers are tending. Many, including some who ought to know better, think that if their picture is soft, that they have attained the acme of all perfection, and that if they construct their glass-house so that it will give delicate half-tone, that they have arrived at that round of the ladder to which all conscientious photographers wish to climb. They forget that it is better to be brilliant than dull. Brilliancy, even if a little chalky, is better than dullness, although it might be, and should be, beautifully round and delicately soft.

The Photographic Section of the Literary and Philosophical Society of Manchester, has at last found something not quite so dry as collodio-albumen, to talk about. At their last meeting Mr. Mudd read a paper entitled "A Photographer's Dream;" had it been by any other man I should have put it aside unread. "Dreams" are usually a dull kind of reading, and literary dreams often induce sleep; but knowing that when Mr. Mudd does write, which is unfortunately very seldom, he has something to say, and knows how to say it in an agreeable manner, I began to read it, and found a treasure of sparkling wit and profound philosophy. Advancing at a step to the twenty-eighth century, he attends a meeting of the Photographic Society of the period, and makes this the medium for a satire on the photographic eccentricities and follies of the present day, concludes by making a speech to the meeting, denouncing the exclusive attention which is paid to ingenious and complicated apparatus, French polish, exact formulæ, and special collodions, and advocating the cause of the right application of these materials, too often forgotten, to the cause of art, with all the fervour, but with a great deal more than the sense, of a stump orator. As from what I have read in a letter from Mr. Mudd, I believe his paper will be reproduced in these pages, I commend it as some of the most subtle humour, especially in its Shakspearian allusions, I have for a long time met with.

The Council of the Edinburgh Photographic Society, a short time ago, appointed a committee to investigate the actinic qualities of the different kinds of artificial light suggested for use in photography. At the April meeting, the committee brought up their report, which is a very elaborate document. The result at which the committee arrived was, that ordinary coal gas was the cheapest that could be used for photographic purposes. Mr. Bow, the convener of the committee stated that the experiments showed that it was necessary to burn about nine cubic feet of gas to produce a negative—this quantity would be of about the value of one halfpenny. One burner would consume this amount in fifty minutes, it followed that fifty burners would consume it in one minute, giving fifty times the light of one burner. Negatives were taken at the meeting with a light produced by 29 small burners, which gave pictures in about eight minutes.

It is tolerably familiar to most folks who have paid any attention to the subject, that, quantity for quantity, coal gas gives the cheapest known light; but the availability of this light, in concentration and unity, if I may so phrase it, so as to render it of any value in photography is quite another thing. And if it could be so concentrated as to illuminate a sitter, it is probable that he would be roasted as well as photographed, from the intense heat evolved; whilst, with an equal light from magnesium, scarcely any appreciable or inconvenient heat would be experienced.

At the London Photographic Society a paper was read by Mr. Willis on "The Aniline Process of Photographic Printing," which promises to be of very great value for copying engineers' plans and architects' drawings. The length of the paper will deter many from giving it the attentive perusal it merits (do the writers of long papers know how easily the patience of a large meeting is exhausted?); the specimens of the process exhibited had much the appearance of lithographs or pencil drawings, and the meeting was assured by the inventor that they could be produced at a very cheap rate. Mr. Dallmeyer read a description of his new lens to which I have already alluded.

At the North London Meeting the Chairman announced that an Exhibition of Arts and Manufactures for North East London would be held in the autumn, in which photography was to be represented under the management of the Association. In consequence of some misunderstanding photography has been classed in the preliminary announcements amongst "Manufactures," this I understand was quite an oversight, and photography has been removed to a more honourable position amongst the fine arts. So that photographers have *not* "grown wiser and eaten humble pie," as has been lately kindly suggested by one of its quondam friends in the last number of the *Art Student*.

The South London meeting was entirely occupied by the reading of, and discussion on, Mr. Hughes's paper on lighting.

Mr. Rogers read a valuable and practical paper before the Photographic Society of Scotland, on "The Temperature of the Bath and Developing Solutions." He stated that he often found a difference of 20 or 25 degrees between the temperature of the operating room and that of the bath solution, a difference it is difficult to understand, and to elucidate which it would be worth while to make further experiments.

Mr. J. T. Taylor read a comprehensive paper on the Wothlytype process, illustrated with some interesting specimens.

Mr. Alfred Hughes's paper on "Minor Improvements Connected with Printing," read at the Glasgow Association, was one of the best that have been read on "Dodges," for some time, and occasioned a long discussion, which is good evidence of the interest taken in it by the meeting.

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NEW PHOTOGRAPHIC CHEMICAL EXPERIMENTS.

BY DR. HERMANN VOGEL.

Numerous experiments upon the theory of photography, upon the peculiar changes which chloride of silver, bromide of silver, and iodide of silver undergo in the light, and upon their influence upon the making of pictures by photography have, for a number of years, been made public. Notwithstanding the great attention which is now paid to this subject, and notwithstanding the interesting data which have been brought to light, still this influence has been only of a subordinate nature as regards photographic practice. The practice has advanced beyond the theory, and has taught the latter more than it has learned from the same.

This is applicable, namely, in reference to the negative process. And so far it is no wonder that the practice has found more to honour it than the theory, and that only comparatively few investigators occupy themselves with the latter, while the number of those who seek to perfect the former is legion. However, I cannot overcome the conviction that the future of photography rests only upon the thorough and accurate knowledge of the physical and chemical processes produced by light, and therefore I have indefatigably continued my investigations, of which the first part has already been made public, and I herewith give to the public the further fruit of my studies, a series of results which, I think, will illumine the darkness which is still spread over many photographic chemical processes.

Light operates upon many chemical combinations in a manner analogous to heat.

There are many combinations which are immediately decomposed by heat, *e.g.*, oxide of silver and oxide of mercury, which, simply upon being warmed, separate into their elements; while, on the other hand, others only become decomposed by heat when in connection with a body which unites itself with one of the elements to be disengaged, as oxide of copper and oxide of iron in presence of hydrogen.

The operations of light are of a similar nature. Certain bodies, as oxide of silver, chloride of silver, and oxide of mercury become immediately decomposed by light; while others, only in presence of a body which unites with one of the elements to be disengaged, as chloride of iron, oxide of uranium, and chromic acid in the presence of organic substances (ether, paper, &c.) which absorb the chlorine to be disengaged, and eventually the oxygen. Even water is decomposed by light in the presence of chlorine, which, with the liberated hydrogen, forms hydrochloric acid. These foreign substances, which are the conditions of the decomposition of many bodies by light, play a most important part in photography, in the case when one has to do with a body directly sensible to light, whose decomposition then, by the presence of such substances, is much more energetic. I believe the entire difference between Davanne and myself, upon the question whether chloride of silver becomes reduced in light to proto-chloride or to metallic silver, depends simply on the condition whether chloride of silver in pure state or in connection with organic substances, is submitted to light. In the first case, proto-chloride of silver is formed; in the latter, metallic silver. The action of chloride of silver and bromide of silver in the presence of light is very simple; both decompose in simple states, chlorine and bromine being disengaged, and a violet or grayish-violet body is left, which body, in nitric acid, delivers no metallic silver.

More enigmatic, on the contrary, is the action of iodide of silver. That which contains a trace of iodide of potassium does not change at all in the light, while that which has a trace of nitrate of silver becomes pale gray-green, but without a particle of iodine becoming disengaged, a circumstance which led me to the supposition that iodide of silver in general undergoes no chemical change in the light. Nitrate of silver favours the change of iodide of silver in the light to a considerable degree.

Why is iodide of silver, precipitated with excess of iodide of potassium, insensitive to light? Why is it, with an overplus of nitrate of silver, sensible to light? What is the nature of the change which the latter undergoes?

Why does nitrate of silver promote, to such a degree, the action of light upon iodide of silver?

The darkness which lay over these operations of light became still more dense as Poitevin came forward with the strange discovery that tannin and similar substances act also as sensitizers, *i. e.*, that they promote the change of iodide of silver as well as nitrate of silver.

Tannin, a substance so entirely different from nitrate of silver—the one a means of reduction, the other a means of oxidation—acts analogously to the nitrate of silver!

Who may solve this enigma?

Long reflections and manifold experiment grounded upon them, show me now that both bodies, nitrate of silver and tannin, however different they may be, still have something in common.

Both absorb, with great ease, free iodine. Drop solution of silver into iodide of starch, the iodine cohering follows instantly, and on this fact is based my new method of testing silver solutions. Drop solution of tannin or gallic acid into iodide of starch, it also discolours.

These facts led me to the supposition that iodide of silver acts in the light as uranium nitrate, or iron salt, *i. e.*, that it is only decomposable in presence of a body which is capable of absorbing the iodine.

To prove these suppositions, I selected a third body, which also easily absorbs free iodine, but which in its other qualities were essentially different both from nitrate of silver and from tannin, namely arsenite of soda—$Na\,O\ As\,O_3$.

Five grains of arsenious acid ($As\,O_3$), and 2½ grains carbonate of soda were dissolved in 50 grains of water, and this solution was poured upon iodide of silver precipitated with an excess of iodide of potassium, which is insensible to light. Notwithstanding the dull light of the day, a slight dimness was perceptible in a few minutes. The next morning the iodide of silver had become of a colour as green as when exposed under silver solution. The experiment was repeated in direct sunshine. Here the iodide of silver, within a few seconds, by shaking, became gray-green. A proof placed at the same time in darkness did not change in the least.

I now tried several bodies which are powerful absorbants of iodine. Next nitrate of mercury, $Hg_2\ NO_3$ as neutral as possible.

In a diffused light the insensible iodide of silver renders this solution within a few minutes green.

A second test placed in the dark remained perfectly bright yellow.

A third body which absorbs iodine is tartarised antimony, although it slowly becomes discoloured by a solution of the same; more quickly by the presence of carbonate of soda; to this its relation as sensitizer was analogous. Iodide of silver in connection therewith became in the light slowly gray; more rapidly by presence of carbonate of soda.

Another body which is a powerful absorbent of iodine is protochloride of tin. I dissolved this with salammoniac in water and put it upon insensible iodide of silver. In a diffused light it coloured rapidly after a few minutes, gray green, the free suspended powder, brown.

A test placed in the dark did not change in the least. Of all the four bodies here experimented with, protochloride of tin appears to be the most powerful sensitizer.

Tannin came next in its working, under this also the coarser parts coloured green, the finer brown.

On the basis of these experiments, which together confirm my supposition above uttered, I think I may venture to pronounce the sentence:—Those bodies which easily chemically absorb free iodine act as sensitizers upon iodide of silver, *i.e.*, they occasion the decomposition of the same in light.

Pure iodide of silver is probably not generally susceptible of decomposition in light.

Whether the considered sensitizers suffer a decomposition even by the reception of iodine (as this will be the fact in most cases), I leave for the present out of consideration.

That these substances in the same manner, according to their ability to absorb bromine and chlorine, also promote the decomposition of bromide of silver and chloride of silver in light, is a fact, which, after the above-mentioned experiments naturally follows, only their presence is not the condition of their being decomposed in light. The explanation of the enigmatical relation of iodide of silver &c., &c., has now no farther difficulty. With an overplus of iodide of potassium precipitated iodide of silver retains a trace of iodide of potassium. The latter is not able to absorb iodine chemically, and therefore no decomposition follows. Iodide of silver with an overplus of nitrate of silver contains still a trace of nitrate of silver, which iodine absorbs, and hence decomposition follows.[*] Independently, the trace of nitrate of silver which is present can absorb only a very small quantity of iodine, therefore the preceding decomposition is only weak, and quickly ceases.[†] If, on the other hand, nitrate of silver is in overplus, as in wet plates, the decomposition is far more energetic and of longer duration, and hence the greater sensibility.

Tannin acts as a sensitizer because it is able to absorb iodine equally as well as free nitrate of silver. An entire series still of other phenomena may be explained easily, and enforced from the foregoing proposition. I omit for the present to enter upon the discussion of these, retaining it to myself for the next article.

After this fundamental photographic theorem has been discovered, it will not be difficult still to find hundreds of organic and inorganic, solid, fluid, and gaseous bodies, which act in a similar manner as nitrate of silver and tannin act, and which, by nearer testing might speedily yield important results for photographic practice.

Dry plates may be prepared, which may, when required for use, be made sensitive, possibly in the camera, by any gas forming a sensitizer; perhaps among the ethereal oils, aldehyde, and oleac acid, bodies absorbing iodine may be found which are remarkable for their ready solubility in alcohol and in ether, and which, in the negative and positive collodion processes without nitrate bath of Mr. Simpson and Mr. Sayce, may be taken as sensitizers in preference to the scarcely soluble iodide of silver, &c. &c.

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[*] According to a private communication from my friend, Carey Lea, in Philadelphia, iodide of silver, precipitated with an overplus of iodide of potassium, is, however, in a strong light, sensible to light, and he writes that he has even made pictures from it. Here, probably, the organic substances of the collodion have co-operated to an important degree. I have lately discovered that, after being exposed to the light for months, iodide of silver paper becomes brown.

[†] It may, at the same time, from this, be explained, why, by the change of the iodide of silver, I could discover no free iodine in the light.

I will here still call attention to one thing, viz.: to the green, or in pure dissolved condition, brown, substance which is formed by the decomposition of iodide of silver in the light. This is probably proto-iodide of silver Ag_2I. I have represented this Ag_2I, through the influence of iodide of potassium upon Ag_2Cl, as a green powder, which, in appearance, entirely resembled iodide of silver which had been changed in the light.

Berlin, March, 1865.

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THE EBURNEUM PROCESS:

Instructions for Working.

BY J. BURGESS.[*]

The first part of the process is simply that of taking a transparent positive on collodion, either in the camera or by direct contact with the negative on a dry plate. This transparency is toned, either with gold, or bichloride of mercury followed with hydrosulphate of ammonia; the former giving a black tone, the latter a brown tone. When dry, the plate is varnished and coated with a mixture of gelatine, glycerine, and oxide of zinc, and when this is dry (which will take about thirty-six hours if kept at a temperature of 60° Fah.), it is again coated with *plain* collodion. In about two hours you may run a pen-knife round the edges, and strip the whole off the glass. After trimming, you have the picture complete.

The transparent positive may also be obtained by direct printing with Mr. Simpson's collodio-chloride of silver. I have of late been experimenting in this direction, but have not very perfectly succeeded. Mr. Swan has, however, succeeded in producing a collodion for printing on glass, and is prepared to supply it; this will render the process as simple and certain as printing on albumenized paper, but for some purposes obtaining the positive in the camera will be preferable.

The following are required for the process, and it will be well to get them all in readiness before commencing work:—

1. Patent plate glass.
2. Saturated solution of best white bees'-wax in methylated æther.
3. Solution of india-rubber in benzole

India-rubber	6 grs.
Benzole	1 oz.

4. A good negative collodion, one giving a tough, horny film is best. (I prefer Blanchard's C.D.V.)
5. Nitrate bath in good working order for negatives.
6. Developing solutions: the iron should be used if the negative is very vigorous, the pyro if the negative is weak and the light strong.

Proto-sulphate of iron	5 grs.
Citric acid	5 grs.
Glacial acetic acid	10 mms.
Water	1 oz.

Pyrogallic acid	3 to 6 grs.
Citric acid	3 grs.
Glacial acetic acid	20 mms.
Water	1 oz.

7. Fixing solution:—

Cyanide of potassium	½ oz.
Water	1 pint.

8. Toning bath:—

Chloride of gold	1 gr.
Water	6 oz.

9. Opaline gelatine:—

French clear gelatine	5 oz.
Water	20 ,,
Glycerine	½ ,,
Oxide of zinc	1 ,,

10. Mawson's enamelling collodion, 4s. per pint.
11. Pure glycerine.
12. Copying camera.
13. Spirit-level.
14. Two or three levelling stands.
15. Drying box.
16. Bichloride of mercury.
17. Hydrosulphate of ammonia.

Now we will set to work. First, let us prepare the opaline gelatine, as we shall want to have that ready for use when we have obtained the picture. Soak the gelatine in the water for a few hours, then dissolve by gentle heat and filter through flannel. Put the zinc white into a glass mortar, add to it the glycerine and 1 ounce of water; when thoroughly mixed stir it into the warm gelatine, and let it stand aside for two hours, in order that the coarser particles may settle to the bottom. It is better then to decant it carefully into a clean bottle, and it will be quite ready for use.

Having previously cleaned our stock of glasses, we pour on one of them a little of the bees'-wax solution, and spread it quickly over the entire surface of the glass with a tuft of clean cotton wool. In a few seconds the æther will have evaporated. We then polish the plate with a piece of clean linen kept for the purpose, which will leave a very thin and scarcely perceptible coating of wax on the glass.[*] This is done as quickly as it is described, and it may be well thus to prepare all the glasses before proceeding. They may be kept for a week or two in a plate-box in this state, without further cleaning.

The next step is to pass a camel-hair brush dipped in the india-rubber solution round the edges of the glass, about ⅛-in. in width, and coat with negative collodion, then immerse in nitrate bath. Whilst the plate is in the bath, we will focus the negative on the ground-glass of a copying camera,[†] just as if we were going to take a transparent positive. We have now exposed the plate, and proceed to develop it. Of course the exposure will vary with circumstances—such as amount of light, size of stop, and character of negative—and can only be ascertained by experiment. The right exposure is given when the half-tones show before a great deal of depth is obtained in the shadows. A few experiments will teach this better than I can describe it; and this is the only real difficulty in the process. The development is, of course, conducted just as for a negative. It is very easy to see when to stop the development. We fix the plate in cyanide of potassium, and having washed well under a tap, place it in the toning bath; here it remains until the picture is toned completely through to the glass.[‡] When it is intended to tone with mercury and hydrosulphate, the exposure must be longer and the development shorter, so as to obtain a very weak positive, because in this case the toning will increase the depth of the shadows. A good washing for a quarter of an hour under the tap completes the picture so far, and we stand it on one side (free from dust) to dry. It should not be dried by heat.

The next step will be to paste strips of paper round the edges of the glass at the back, turning up the edges for about a quarter of an inch, so that when the plate is laid down collodion side up, a dish will be formed, into which we pour the gelatine mixture prepared as above.* The plate should rest on a levelling stand made perfectly horizontal with a spirit-level. As soon as the gelatine is well set, the plate may be placed in the drying box. An old box or barrel of any description will answer for a drying box. It should be well washed, the bottom perforated, and a cover of perforated zinc provided. It may be heated by an ordinary paraffin lamp or by gas, the plates resting on nails driven into the sides. The temperature may be between 60° and 70° Fah. In thirty-six hours the gelatine will have thoroughly dried. It is then coated with the plain collodion or with varnish, or with both if it is desired to make the back thoroughly waterproof, and left for about two hours if the former be used. Now run a penknife round the edges, and the whole will readily leave the glass, having a perfectly polished surface. It only remains to trim the edges, and the eburneum portrait is complete.

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[*] Some explanation is due, on the publication of these details, to those of our readers who have paid Mr. Burgess a fee for instructions in working his process. This explanation will be found in a letter from Mr. Burgess in another column, from which it will be seen that Mr. Burgess had no intention to break faith with his subscribers, had not the instructions from some misunderstanding been published in a contemporary. Mr. Burgess sends us, with this communication, some of the most charmingly delicate pictures we have ever seen produced. This article is expressly written as containing his latest experiences in working the process.—Ed.

[*] You need not fear rubbing off *all* the wax as it is almost impossible to do that if you let the æther evaporate before commencing to polish.

[†] I use a camera constructed for the purpose, with repeating back to take four cartes on a whole plate.

[‡] If a brown tone is desired, instead of toning with gold, flow over the plate a saturated solution of bichloride of mercury, let it remain until the image is white quite through; wash well, and apply a weak solution of hydrosulphate of ammonia: water 1 oz., hydro. ammon. 6 drops. The tone will vary with the quantity of ammonia employed.

A List of Failures, with their Causes and Remedies.

1. *The Whites of the Picture are not pure, although the Gelatine Mixture is as white as may be desired.*—The evident cause is fog, arising either from the bath being out of order, or over exposure. A slight amount of fog may be removed by flowing over the plate a solution of iodine in iodide of potassium.

Tincture of iodine	6 drops
Iodide of potassium	2 grains
Water	1 ounce.

Allow this to remain on the plate for a few minutes, wash well, and follow with a weak solution of cyanide of potassium. Take a drachm of the fixing bath to 4 ounces of water.

2. *The Picture is hard, although the Negative is soft.*—Under exposure and over development is the cause.

3. *The Surface is not good on leaving the Glass.*—Too much wax has been left on the plate.

4. *The Picture leaves the Glass in places, mostly in the Centre, spoiling the Surface.*—The gelatine was too hot when poured on the plate. It should be used at a temperature of about 100°.

5. *The Surface becomes dull after leaving the Plate.*—The gelatine has not been allowed sufficient time to dry. This will also cause warping.

6. *The Eburneum is granulated and streaky.*—The coarser particles of the zinc white have not been allowed to settle sufficiently before using, in the first instance; and in the second, the gelatine has stood too long, so that a part has become clear and not been mixed with the white again.

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ABOUT LIGHT, AND ABOUT LIGHTING THE SITTER; With some Reflections about the Room in which he is Lighted.

BY JABEZ HUGHES.†

It is an admitted photographic maxim, that we cannot get a brilliant print, except from a good negative; so it may be equally affirmed that we cannot get a good negative except from good lighting. A well-lighted picture is one where the light falls chiefly in one direction, so as to form well-defined but soft shadows. Then a secondary light must be admitted, not so strong as the principal, otherwise it would just undo the work and produce flatness, but it must be just strong enough to light the main shadows, so that they shall not appear too hard and abrupt, but delicate and soft. If the secondary light does not do this, it is not strong enough, and the picture will have too much contrast. Discussion has taken place as to whether the chief light should come from the front, the side, or the top of the sitter. I think wherever the light comes from *one* distinct direction, it is bad, as the shadows produced will be too decided (I am speaking of lighting the sitter's head). I think the principal light should come in such an oblique direction as to be partly from the top, partly from the side, and partly in advance of the sitter. I think the secondary lights should be almost the reverse, so that the two sets of lights should be in opposition. I think there should be a gentle struggle between the two for the mastery, but one must always predominate and govern, not rudely and violently, but gently and sweetly. Shall we be poetical and say the principal light must be masculine and vigorous, and the secondary one be soft and feminine, so that the effect of the union is such a happy blending of light and shadows with a myriad of connecting half-tones, that you cannot tell where one ends and the other begins, but where each is present to strengthen and beautify the other, like two souls wedded in perfect harmony?

I think the true test of good lighting is the preservation of delicacy of half-tone. Ruskin says, that he can only find one thing common to all great artists, delicacy. May we not say the same of our clever photographers. Consider the works of Bedford, Robinson, Williams, England, Wilson, Blanchard, Mudd, Heath, Thurston Thompson, and the many others equally skilful, and in what do they excel so much as in their wondrous delicacy? And what is delicacy but another name for soft and tender half-tone? Remember there is quite as much beautiful and delicate half-tone in the deepest shades as in the highest lights, and all is produced by a harmony of opposing lights. The first condition however, is for a person to feel and love these delicate gradations, to be happy when they are present, and miserable when they are absent. When this condition of mind is produced, the quick hand and sensitive eye will find means to register them on the plate.

The first claim of photography is, *that it is true*. Deprive it of this virtue and all its other merits are valueless.

But the presence or absence of half-tone is the principal element of photographic truth. It is not usually thought so, but it's a fact. Let us take an instance. Two men put up a round wooden ball to photograph: one turns on his indiscriminate blaze of light, and so produces a *flat* picture from the *round* ball, just as if it had been a wooden plate; the other so arranges his illumination, so lights his figure, that the round ball looks like what it is, and in the photograph it seems to almost stand off the paper. Both these are photographs from the same object, yet one is true and the other false; and the truthfulness of the one consists in carefully registering all the gradations of the half-tones that represent the rotundity of the ball; and the falseness of the other consists in the omission of these half-tones, so that it represents a flat plane. The human head is nearly round; let us suppose that, instead of a wooden ball, it was a head these two men took to delineate, do you mean to say that the man who lost the likeness in the ball would not also lose the likeness in the head? And if the other, by careful management of light and shade, most perfectly produced the likeness of the ball, would he not as surely secure the likeness of the head too? Is there not here a clue to why some persons take better likenesses than others? May not some of us take a hint and practice on the wooden heads?

"How to Light the Sitter."—The enquiry still crops up. It is certain we have gone on long enough lighting the sitter from the photographic point of view, that is, blazing away from large skylights till almost blinding him, but, as a rule, we have not produced satisfactory pictures. Let the endeavour rather turn in the other direction. Let the artist's studio be the model, but as that is only the other extreme, suppose a compromise be made, the idea being, that the studio of the photographer furnishes the light, the other the delicate half-tones.

Some persons make it a rule to examine the image carefully on the ground glass, and never to take a picture until it is seen satisfactorily there. This is a good plan when judging of the sharpness of the focus, the size of the picture, and the presence of the proper amount of accessories, &c. But on the ground glass is not the best place to see the amount of light and shade to be represented on the sitter. The late Mr. Lacy accurately expressed the idea when he said, "I arrange the light and shade on my sitter just as I wish it to appear in the finished photograph, and I never proceed with a negative until I have satisfied myself on this point. I look at the sitter's head, and I watch the effects as I change the lighting, and when I have the best arrangement I take the photograph; I expect the lens to give me just what I see with my own eyes." In this, no doubt, is contained the true idea. The lens is a blind instrument; it will delineate what is presented before it, and the photographer is responsible for its work.

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* Three ounces of gelatine mixture to a whole plate. The paper is not required for small plates.

† Continued from p. 189.

"As the sitter's lighted, so's the picture drawn."

Some people have an idea that the collodion should give the modelling; this is wrong. Collodion cannot give what it has not got. Collodion, good collodion, can register the modelling if it is in the sitter, but if it is not there how can it? A Scotch minister once reproved a parishioner for going to sleep during the sermon. "Man," says he, "could you no tak' a pinch o' snuff to keep you awake?" The reply was, "Minister, could you no put the snuff in the sermon?" Depend upon it, if we rely on the collodion, or on any of the chemicals, for the modelling, we are looking for the snuff in the wrong place.

In another part of this essay I have spoken lightly of the *form* of the "illuminating room." I wish to be understood on this point. Though Mr. Williams, Mr. Blanchard, and Mr. Cooper take charming pictures in their ill-arranged rooms, yet it is certainly not in consequence but in spite of their disadvantages, and they all agree in deploring their existence. Any room with mainly a south aspect must afford much more trouble than one looking north, and much valuable time will be saved if the natural arrangements are in harmony instead of being in opposition to the artist's wants. Although a true artist can dispense with accidental aids, it should never be beneath his notice to seize them when he can. It occasionally occurs that a room by a happy accident may suit to produce such charming effects that even a mechanical photographer may turn out really artistic pictures. I have a case in point. Some time since, a very distinguished London photographer asked me if I knew Mr. Blank, who lived in Dashtown. I said I had heard of him: did I know the character of his pictures? I did not. "Well," said my friend, "a lady brought me a picture to show; it was one of the most lovely things I had ever seen; such brilliancy, such modelling, and such delicate tones. The picture haunted me and I was not easy till I went some two hundred miles to see and talk with this man. I saw scores of his pictures as good as the one I first saw: I talked to the man, and, to my astonishment, he was as ignorant as a pig. He let me see his glass room, and the whole thing was explained. The room was a brick building, with a large window on one side, extending partly up the roof. The aspect was a clear uninterrupted north one, and therefore, from one year's end to the other he worked without trouble or inconvenience, producing these lovely things. The one main light came on the sitter, and the light sides of the room reflected gentle streams of light that softened the pure and brilliant shadows." Such was the explanation given me of the cause of these beautiful pictures. It appears this person knew his pictures were good, and took credit for them, but a proof was afterwards given that he really knew nothing of the cause of his success. He had occasion to build for himself a glass room in another town, and he erected a light barn of a place with glass all over, and took as bad pictures as any sixpenny man who works in the open air. The amusing part was the bewilderment of the man why his pictures were not as good in the one room as in the other.

I am happy to bear witness to an excellently devised glass room built by Mr. Stuart, of Glasgow, at Helensburgh. It has a clear uninterrupted northern aspect, on which the sun never shines; there is not a blind or screen of any kind in it, and the pictures produced are really models of good lighting. Its goodness consists like the person's whom I have called Mr. Blank, in its being happily placed before a clear north light, and the sides of the room act as reflecting screens to modify and soften the shadows. The building of this room, however, in this way is not an accident; it is the result of much experience and reflection, and it was constructed to do what it has perfectly accomplished, and is, as creditable to this gentleman's sound theory as it is satisfactory in his daily practice.

(To be continued.)

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A PHOTOGRAPHER'S DREAM.

BY JAMES MUDD.*

The subject of this paper being neither literary, philosophical, nor scientific, causes me to doubt its suitability to the place in which it is read, and to the audience met together to hear it. It seems like profanity to disturb the serene air of this apartment with words comparatively idle; or to attempt to amuse in a place devoted to the consideration of serious and profound subjects—a place accustomed, as it were, only to the language of science, and whose very atmosphere is heavy with the deep things belonging thereto. It is really a quaint, old-fashioned, and quiet spot, this Literary and Philosophic Society's building. There is nothing like it in this city. It is a remnant of old days, unaltered by the busy rush of time, which has made such a change around, sweeping almost all contemporary dwellings away, and raising up proud, palatial warehouses, which now look down scornfully upon its simple architecture. The church of St. James, just opposite, with its melancholy graveyard, is now the only remaining companion of its early days; and although nothing can be said in praise of the architectural appearance of either, yet there is a charm which time has given, and gathered round them both a human interest which their fine new neighbours do not possess. To the one attaches all the interest of a spot so long associated with the active life of men devoted to philosophical and scientific pursuits; to the other, the sadder interest of a place where all, even the greatest, come at last to rest! How many have laboured and passed away around this spot since these two old buildings were raised! And possibly these ancient and lonely acquaintances, when exchanging a word or two on past times and the downfall of old friends, may encourage and sustain each other, by a consideration of these old and honourable associations, to maintain that calm and dignified demeanour towards the flaunting modern structures which a true and ancient nobility always displays to the mere upstarts of yesterday.

Well, here, however, hemmed in by lofty structures of imposing stone, stands this unpretending mansion of brick; wearing, amid the noise and hurry of the street, the same unmoved look it had when Dalton worked out his mighty problems within its walls. And when you enter, there is such a last-century feeling about the place that you would not be surprised to see a man in knee-breeches, silk stockings, and long flowing wig gravely seated in the library, and his cocked hat and sword in the hall. The fittings and furniture are all of that date. In this lecture-room you observe the attenuated benches with the faded crimson cushions, the high chimney-pieces, the mural tablet, with the festooned marble drapery neatly tied up at each corner with marble ribbons, and bearing an inscription to the memory of Percival; the portraits of Dalton, and Clare, Henry, Holme, and Joule—those worthies who have given here the grand results of their patient labour and research. All these surroundings make this room anything but a fitting place to talk lightly in. I declare now, touching these portraits, I fear they may be scandalised with the levity of my paper, and look down upon me with a severity which I could not endure; and I do hope that, if any of my hearers should perceive any change in their solemn countenances—any frown gathering on those thoughtful brows while I am engaged in delivering the light fancies strung together for your amusement, you will immediately give me some sign that I may make a speedy and safe retreat.

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* Read at a Meeting of the Literary and Philosophical Society of Manchester (Photographic Section), April 6, 1865.

But after all, in one sense, this is not a bad place to make a joke in. Jokes go a long way, even bad ones, where few are ever made. They come out very strong in places dedicated to opposite purposes. This plan, by the way, might be carried out with good effect. Thus the bow of the learned professor would seem still more grave and profound on the boards of a theatre, and the "Here we are again!" of the clown become irresistibly comic on the scientific platform.

But to come to my dream. Well, this is how it came about: some weeks ago, I attended a meeting in this room, just to keep myself well informed on the various inventions and discoveries which issue, from time to time, from the great band of photographers throughout the world, it being no easy matter to keep well up in this rapid march of mechanical, chemical, and scientific progress. And I saw and heard much that was cheering—much that showed we were moving, and, upon the whole, we were rather a wonderful people in this present generation. But this naturally exultant feeling received a sort of chill before I left the meeting, for it was reported that some learned Greek had done centuries ago what we have just been doing—possibly better. What a drop to our vanity! So it comes to this: we are diligently rediscovering what was known a thousand years ago, and it cannot therefore, be unreasonable to suppose that, at some remote period of time—after our present knowledge has been buried long enough to be forgotten—it will again be discovered, dug laboriously up by enthusiastic photographers, who, in their turn, will indulge in self-glorification like ourselves.

Such fancies filled my mind after I reached home, and I gave way to them as I sat moodily looking into the fire. These views were not very encouraging. Certainly, I thought, there is nothing new under the sun. The great wheel of time, as it slowly turns round, brings the same spokes up again—and so it ever will be. To divert my thoughts I took up a volume of Shakspeare, and, strangely enough, came upon a passage which seemed, in my then excited mood, to bear strong evidence of the existence of photography in Macbeth's days. It commences—"Is this a dagger which I see before me?" Now, in these days of Shakspeare emendations, when one can, as it were, have any "reading" one likes, why shouldn't the word dagger be written "Daguerre?" Then with this new spelling of the word, see what evident light is thrown upon the passage! Look at it now—Macbeth is evidently holding in his hand a portrait of his lady, and as he gazes upon it, says,—"Is this a Daguerre which I see before me?"—just as we should say—"Is this a 'Williams or a 'Silvy?'" That the portrait formed the centre of a handscreen of the period is evident, from the next sentence—"The handle towards my hand;" and then comes that fine burst of rugged and vigorous language of affection—"Come! let me clutch thee!" He would embrace the image, forgetting for a moment it was only this, and not the fair original, and adds—"I have thee not, and yet I see thee still. Thou art not sensible to feeling as to sight." So, when I got so far, I closed the book, lest I should find the carbon printing in *Othello*, the honey process in *Romeo and Juliet*, or the Wothlytype in *Much Ado About Nothing*.

As I sat thinking of these things, fully determined to send this new reading to Mr. Collier or Mr. Dyce, I was conscious of getting sleepy, and my thoughts became unconnected and fragmentary. In this state things got oddly jumbled up together. Thus the word "Dyce" seemed to set me thinking that the gentleman of that name was tossing up with Collier whether my new reading should be the correct one or not—a very good way of settling it, I thought—and then off I went at a tangent with Collier, and that he wouldn't be of any use when the coal measures were exhausted; and this naturally brought me to the distant future, and particularly the future of photography, what it would be like, and would there ever be anything new! I was roused to momentary consciousness occasionally by a falling cinder, or the dropping together of the fire in the grate; but, gradually, I found myself yielding to the pleasing sensation of approaching sleep, and the last thing I remember was a sort of drowsy conviction that there never would be anything new. And here I must have gone off.

But it did not appear so, for I was aroused again, as it seemed, by a voice, speaking in a peculiar accent, close by my side. I looked up, and beheld without surprise—for nothing I then or subsequently saw in the least astonished me—a little old gentleman. He was dressed in long, graceful garments, classical in shape, and fastened at the waist with a girdle studded with small gold stars. The dress or robe was of violet velvet, with threads of gold an inch or so apart. He had a long, grey, pointed beard, and his hair was brushed up very stiffly above his forehead. The space devoted to his features was long, as if drawn out perpendicularly, giving a round appearance to the eyes, and an expression of chronic whistling to the mouth.

A surprised, jaunty, wide-awake look was the result; and there was a merry twinkle in his bird-like eyes as he asked me "if I felt refreshed?" adding, "if so, it was time to be off." "To bed?" I asked. "Why no, not yet, my friend. You seem to forget our appointment at the meeting of the Grand Focus Photographic Society this evening; and really it is time to start. My chariot is at the door." Putting on his head a hat like a white extinguisher, with a very narrow brim, my queer friend led the way, and I followed him to the door, where I observed a sort of half carriage, half gondola in shape, into which we stepped. The vehicle had no horses attached, but a man jumped up behind when we had taken our seats, and immediately we were in motion. The movement was rapid, smooth, noiseless, and pleasant. I could not see the source of motion. It was evidently below; and we ran upon rails of a material which gave no sound.

But my attention was attracted to other things. I found myself in a wide, magnificent street, down the centre of which was one long line of trees and fountains dividing it into two avenues, along which carriages, similar to that we occupied, were gracefully gliding. The vehicles moved in one direction only in each avenue. A broad pavement on each side the street was lined with shops and buildings of great architectural beauty, and the stone of which they were built was of a pure whiteness, upon which no signs of smoke or weather stains were observable. A stream of foot passengers, gaily dressed, lounged almost noiselessly by, the sound of feet being deadened by the peculiar material of the pavement. The shops were brilliantly illuminated, and as my eye wandered from one to another of the glittering stores, I noticed—but still with that strange unconcern only met with in dreams—on an elegant signboard the characters, "Established since the year 2780. Aaron and Son. Branch establishments at North Pole and Central Africa.

The air was warm, and scented with delicate perfumes; and no wind stirred the leaves of the trees. A soft purple light, from above, fell upon this gay scene, and, catching the spray of the fountains, made a silver mist among the trees; while the absence of other sounds, left the cool plash of the water distinguishable to the pleased ear. On looking up, I found the illumination proceeded from hundreds of little points or stars of light, dotting the darkness of the sky, while a vast arch of glass, spanning the space above all, was just discernible as it here and there reflected back the flash. Surely, this was a lovely scene; and, somehow, I seemed to be enjoying a most delightful combination of the Crystal Palace, the magnesium light, kamptulicon, and Moses and Son—the whole pleasantly scented by Rimmel's perfumes.

My companion (who had been nodding frequently to acquaintances on the way), now calling my attention to the light above our heads, expressed his opinion that the recent discovery of the metallic illumination was one of the greatest inventions of the "present twenty-ninth century;" and he thought it probable that it might be introduced into the practice of photography—an art almost as recent in its birth. Thus chatting, we arrived at the entrance to a plain, yet chaste, building; and, descending from our steedless carriage, passed through an elegant entrance hall, and found ourselves in a small lecture room. In this apartment were some twenty or thirty gentlemen in similar costume to that of my guide, and who bore, more or less, a resemblance to his general wide-awake countenance. They were gathered in little groups, talking, as we entered, but immediately began to seat themselves, and prepare for the evening's business. In the centre of the room was a large square table, on which was piled a perfect pyramid of apparatus, many pieces bearing a strong resemblance to the familiar shapes I had been accustomed to see in my previous state of existence.

My companion was called to the "chair," and I now heard for the first time that his name was Professor Dump. Previous to occupying that distinguished position he motioned me to a comfortable corner—my presence seeming to cause no curiosity amongst the members.

After a few formal business matters had passed, the learned Chairman rose, and, addressing the audience, reviewed generally the rise of photography, but more particularly the progress made in the delightful art by the members of the "Grand Focus Photographic Society" during the past year. He was happy to tell them, at that their annual meeting, that much advance had been made; but, first adverting to the early history of the art, he spoke eloquently of the great pioneers who had led the way, and to whom they were so much indebted. There was first the great Searcher of the Sunbeam; he who, from the Pale Ray, disentangled a skein of glorious hues, and showed them the Mystery of Light! And long after him came Guerredag, true transmuter of metals, who made the silver tablet more precious than that of gold, by impressing upon its surface images above all price! And Tallbey, who took these pencillings of light, and spread them bright and fair upon sheets of pure and snowy paper. And later still Archeri, discover of the etherial fluid and the chrystal; he who, in baffling the weired and potent Guardians of the Secret, fell exhausted in the conflict, but falling held aloft, for all men's use, the prize he had so valiantly won! But he (Professor Dump) would turn from these mighty names, and come to the present position of the art; and, although he could not boast of discoveries like these to which he had just referred, yet he thought there were several very important things he could mention. Not the least of these was the remarkable advance made in the direction of photography in colours. As yet experiments had not met with complete success. There seemed to be a good deal of uncertainty in the results, for the colours came sometimes when they were not expected, and didn't come when they were, and they were not always the right ones when they did come, and invariably vanished before anybody could see them. It was curious, too, that only in remote corners of the earth, and to men unknown to fame, were there any "manifestations" at all. But, he hoped, these trifles might be overcome, and the bright hues of nature be added to the other charms of photography. To the mechanical aids, and the elaborate apparatus which engage the attention of photographers of the present day, he could proudly refer. He had only to point to the table before him. He hoped to have the pleasure of hearing some of those objects described that evening by the ingenious inventors; but meantime an instrument which he did not observe amongst them, of very wonderful construction, demanded a passing notice. He referred to the revolving camera. He could not fully describe the instrument, as it was somewhat complicated, and showed surprising inventive power. Indeed, it must have been revolving a long time in the head of the maker before he brought it out in that perfection. Well, he might say, however, that the grand principle in its construction was, that everything about it revolved—the camera revolved—and the lens—and the legs, each on its own axis; and the operator, also, was made calmly to revolve on his. The whole was dexterously set in motion by a lad with a handle, who, if necessary, could be made to revolve as well. He, the Professor, thought this was indeed a *revolution* in photography; and, he was happy to say, the result was as well as could be expected. Indeed, it appeared to answer quite as well as an ordinary camera which did not revolve; but, of course, was more difficult to do. He called that "progress," and added that the inventor's great objects being to introduce clockwork, and possibly steam, deserved their hearty sympathy and approval. Such men were the real promoters of photography as a fine art; and its claims as such could not be long delayed. Then, there was the camera called "the pointer," which, he might say, seemed almost imbued with intelligence, for, mounted on its slender legs, and carefully wound up, it would then, like the dog of that name, go forth in search of views and stop when any nice arrangement of nature came before its artistic eye. Turning from the mechanical to the chemical inventions, he was proud to mention that new concentrated essence of light, which, according to a calculation of Professor Colross, enabled you to carry a million tallow candles in your waistcoat pocket, or rather the illuminating power of about that number of dips. It was supposed—with what truth he could not say—that that light was the same which the lonely inhabitant of the moon employed in nightly lighting up that satellite; but for his part he should be sorry to call it moonshine. He would call members to rejoice with him that the various chemical and other preparations necessary for the pursuits of the art were so admirably prepared and plentifully offered to the brethren. He could not glance at the advertising portion of the journals devoted to photographic lore without feeling grateful to the men who so modestly put forth the claims of their "pure etherial fluid," and other preparations, the use of which, they confidently assured them, would give to landscapes the most artistic qualities, and throw the charm of elegance and refinement into portraits of the most ordinary individuals, so that "none need despair;" for, by using the fluid of Huggs or the metal of Muggs, even the uncouth countenance of the mighty potentate of the Cannibal Isles might be made to wear a soft, lovely, and engaging expression. But he must hasten to close this cursory glance at the year's progress. The learned Professor then made a few further remarks on the onward progress of the art, of its application to many useful purposes, and the wonderful developments it might be expected to assume in the future; and expressed a hope that the crowning triumph was not far distant—that the end was near towards which men were urging their determined way, overcoming all obstacles in the path—that the day so long waited for, so long delayed, would soon brighten into dawn, and photography rise resplendent and perfect by the application and assistance of—steam power! He concluded by regretting that one body of men did not understand the true position of photography. He referred to the painters, who, as a class, were opposed to its recognition as a fine art.

(To be continued.)

PHOTO MINIATURES ON ALBUMEN.

BY WILLIAM F. SPIELER.*

There are two methods by which the photo miniature may be obtained on albumen: one with the camera, and the other by contact with the negative. The plates are prepared in the same manner for both processes, and may be kept on hand for use for a considerable length of time.

Take the white of eggs, from which the germ has been carefully extracted, and add one third the quantity of water, by measurement; beat the whole well together until you have obtained a stiff foam; then let the mixture subside into its liquid state, measure it off carefully with a graduated glass, and add for each ounce of the solution six grains of chloride of ammonium dissolved in a small quantity of water; beat the whole into a stiff foam again, and let it subside. After this it must be carefully filtered, when it is ready for use. Be sure that your glasses are perfectly clean before coating, and handle them as little as possible. Place the glass on a rest perfectly level, or, what is better, balance it on the tips of your fingers, and pour the albumen slowly and steadily on the surface. Let the excess drain off on the side or end (not from the corner), and lay it by to dry in a warm room. The side or end from which the albumen has been drained off should be placed a little lower, in order to clear the plate entirely from excess of coating.

The silver bath used is the same as for ordinary albumen prints, and the plates are dried, after silvering, the same as paper.

If the print is to be made in the camera, the silvered plate may be moistened with a weak solution of gallic acid in water, and used while wet; the image is then developed with a gallic acid developer, and fixed with a fresh solution of hyposulphate of soda, and then carefully washed. If the colour is satisfactory, it may then be set aside to dry; or if deficient in this respect, it may be toned with a weak solution of hydrosulphate of potass, or a gold toning bath. It is then washed again, and dried.

For ordinary printing by contact, the printing frame should be expressly made for this kind of work, to prevent scratching and breaking of the plates; also, to insure the perfect registering between the plate and the negative. In other respects, the printing is the same as for ordinary albumen prints. The picture is toned and fixed in the usual way, and, when washed and dried, is ready for use.

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* From the *Philadelphia Photographer.*

In conclusion, I may here remark that the first of these processes is only recommended where a picture is to be obtained differing in size from the negative from which it is to be made. For all other purposes, the contact process is by far the best.

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Correspondence.

THE "EBURNEUM" PROCESS.

Dear Sir,—Will you allow me space briefly to explain the circumstances under which the particulars of the above process appeared in the *Photo. Notes* for May 1st. I sent Mr. Sutton a few specimens, and the instructions for working the process, just as I supply those who pay me two guineas for the same, of course not intending he should publish them. He has, however, from some misunderstanding done so, and the matter is now entirely out of my hands, much to my loss. How the misunderstanding has arisen I cannot say, as I stated in my note to Mr. Sutton that I was charging a small premium for the process.

A correspondent in last week's News complains that the "Eburneum" pictures are very much affected by *damp* and *dry* weather. I know they will not stand soaking in water, nor roasting before a fire, but none of the specimens in my possession have been affected, with ordinary keeping, to anything like the extent described by your anonymous correspondent. I have sent out a large number of specimens and shall be glad to hear if anyone has met with the same experience as the one who has paid his two guineas and now seems sorry he has done so. It is quite true that the pictures produced up to a certain time were slightly affected by damp; but this has been overcome by simply burnishing the film before applying the opaline mixture. This renders the surface harder also, so that it is not easily scratched.—Yours truly, J. M. Burgess.

P.S.—As the process has already been made public, I enclose, for insertion in the News, a copy of the instructions, corrected from my latest experience, and a suggestion for a modification, which consists in the employment of your collodio-chloride of silver for obtaining the positive.

THE WET COLLODION PROCESS WITHOUT THE USE OF THE NITRATE BATH.

Sir,—Since I last wrote to you on this subject, I have had but little time for continuing my experiments. In fact, I have only tried one new method of working with this process by the use of sulphate of copper in the developer. The formula used for the enclosed negative may be stated as follows:—

Collodion, Thomas' bromo-iodized negative	2 ounces
Nitrate of silver	30 grains.
Pounded, &c., as I mentioned in my last.	

Developer:—

Ammonia protosulphate of iron	1 drachm
Sulphate of copper	½ "
Water	4 ounces.

In adding acetic acid to this solution, I made some slight error in the quantity, but as nearly as possible, it was in the proportion of 6 drachms to the 4 ounces; but I will in another experiment determine this point more precisely.

The plate, after exposure, was plunged into distilled water for a few minutes, and then the developer, to which a few drops of silver were added in the usual way, was applied, the image was complete in about fifteen seconds, and a slight subsequent intensification, with pyro and silver *before* fixing, completed the developer. I should like here to remark that though *this* plate was plunged into *distilled* water, others I took at the same time were put into water, in which some of the developer had been spilt, and these developed quite as well as any of them. It would seem from this, that the plates, if used for landscape photography in the field, might be plunged one after another into a grooved box, containing water, and as soon as developed, after a slight rinse, returned to the box to remain in the water until their return home, when they might be intensified at leisure, it is evident that such a proceeding would save a large quantity of water, &c., in the field, as a box to hold twelve 7 × 4 negatives in grooves would only hold a very small quantity of water, not a quarter of what would be required to work that number of negatives, especially after fixing. Hoping soon to determine many prints, which seem of importance, I beg to remain your obedient servant,

Belmont Lodge, Lee, E.C. Nelson K. Cherrill.

[The negative enclosed is remarkable for its extreme delicacy. Ed.]

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Talk in the Studio.

More Cyanide.—The public prints record another suicide by cyanide of potassium during the week. We repeat these cases to impress on photographers the deadly character of the poison they so often deal with carelessly.

A New Process for Book Illustration.—It is stated that we are likely to have an entire revolution in the art of wood-engraving; or rather the art of wood-engraving is likely to be altogether superseded by a new process. It is the invention of an American gentleman, and its name is given in the title of a company that is being formed, on the limited liability principle, for working the patent in this country. At present the cost of producing illustrations for periodicals, is something formidable, and this not always so much from the sums that are paid to the artists, as from the expense of engraving the wood after the artist's drawings. It may be stated generally that an ordinary illustration, similar to those we see in the *Cornhill Magazine*, occupies the engraver from two to six days, and costs from five to ten guineas. By the Graphotype process the artist is his own engraver, and the most elaborate and most extensive drawings may be made ready for printing within six hours of leaving the artist's hands, and only costs shillings where wood-engraving costs pounds. The process is very simple. First of all, a metal plate is procured, and on this a layer of very finely-pulverized chalk is placed, and then compressed by very powerful hydraulic pressure, until it becomes a hard substance. On this the artist draws with a prepared ink, which has the quality of still further hardening whatever portion of the chalk it touches. The chalk that has not been so drawn upon is then removed by a soft brush, and the inked portion is thus left in relief, and a chemical solution that is then applied reduces it to a hard stone. It is then ready for the press. The *Art Student* for the present month, we observe, contains a fine example of the results.

Origin of Vignette Glasses.—Mr. Forrest, of Liverpool, writes as follows:—"My attention has been called to a paragraph in your "Talk in the Studio," of the 13th April: Mr. Werge's statement is perfectly correct as to my being the originator of the Black Vignettes, which, in my opinion, are still the best. Mr. Henderson, my assistant, suggested the brown vignettes, and Mr. Macintosh the stained ones; the latter increased the facility of manufacture, and consequently the cheapness of production, but does not come up to a well-graduated black vignette.

Photography in Marseilles.—Mr. G. A. Sala recording the progress of the Emperor to Algeria in the *Daily Telegraph*, gives the following amusing sketch of photography in Marseilles:—"The people are amusingly vain; but their vanity is of the most harmless and good-natured order. Thus photography is a branch of the arts enjoying immense popularity in Marseilles. You may be photographed almost as large as life for a hundred francs, and you may obtain a single *carte de visite* as low as seventy-five centimes. There is a mine of drollery to be worked in the advertisements over the showboards of the cheap photographers. "*Faites vous faire comme ca pour un franc cinquante;*" "*Exactement pareil pour deux francs;*" and the like. Then comes a wondrous penny plain and twopence coloured view of the interior of a studio, with a little man with a big beard levelling his camera at a lady in a flame-coloured moire and long ringlets. "*Salon de pose du photographe!! Monsieur Duviquet opérant luimême*!!!" Thus runs the legend. Let not the accumulated notes of admiration be omitted. The Marseillais is always in the superlative. But why should not Duviquet operate himself? it may be asked. Is he such a very great Count, this Duviquet? Imagine a showboard hung out in Regent-street, or Parliament-street, with "Mr Mayall, as he appeared adjusting the lens," or "Mr. John Watkins focussing the Lord High Chancellor."

SOIREE.—The Soiree in connection with the Architectural Exhibition was held on Tuesday evening last, when the fine collection of photographs, as well as the examples of architectural art, were examined by a large and fashionable company. Both exhibitions are now open to the public.

PHOTOGRAPHIC SOCIETY.—The next meeting of the Photographic Society will be held on Tuesday evening, May 9th, when Major Russell will read a paper on his recent modifications in the Tannin process. The Society's Soiree will be held on the 8th inst.

MR. ROBINSON'S "AUTUMN."—A very charming small reproduction of this picture was given in the last number of the *Photographische Mittheilungen* as an illustration of Mr. Robinson's article on printing from several negatives, translated from our pages. A notice accompanying the illustration stated the great admiration which the original had received in Berlin, being the first work of that kind by photography, which had been seen in that part of Europe.

PHOTOGRAPHIC CHEMISTRY.—We understand that Mr. Keene of Leamington finds the demands upon his time and attention, made by photographic chemistry, sufficient to induce him to surrender his business as general and dispensing chemist, to devote himself wholly to the wants of photography. Such circumstances do not look like decline in the art.

NORTH-EAST LONDON EXHIBITION OF ARTS AND MANUFACTURES.—In the Photographic Department of this Exhibition, under the management of the North London Photographic Association, prizes will be awarded both for photographs and apparatus.

OBITUARY.—On the 1st inst., at his residence, Wellington road, Bromley, Middlesex, Matthew John Rippingham, Esq. aged 71. Mr. Rippingham was one of the earliest photographers, and, we believe, a member of the first council of the Photographic Society.

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To Correspondents.

SOL.—It is difficult to get a satisfactory direct light by means of sunlight filtered, as it were, through a blind; but it may, under special circumstances, be done. As a rule, it is best to stop out all direct sunlight with double blinds, and use the light from one side only during the time when direct sunlight would enter the room. It is best to have the room so constructed that you can place the sitter at either end, so that either side of the face may be taken with one side light only.

ST. G. S.—Your light is too directly in front of the sitter, which tends to flatten the face. The direct light should be a little to one side, in order to secure light and shadow, and roundness. It is difficult to form an idea of the abilities of an operator, from examining three or four prints, but it is probable you may find an engagement in connection with photography.

COPYRIGHT.—The German lithographs to which you refer are, for the most part, piracies. The "Light of the World" is copyright, and it would be piracy to photograph it.

BETA.—The "Building Act" so often referred to, without any other qualification, means the Metropolitan Building Act, and only governs the erection of buildings in London. In some towns there is no control; in others, there is some special Act under the administration of the Board of Health, or similar body, which possesses the control. You will have to ascertain the law or usage of any especial town, and wherever there is a public or district surveyor, it is better to consult him, as it may save future trouble.

S. H.—The acetic acid would have been better absent; but you may, nevertheless, if necessary, add nitric acid to a bath containing acetic acid, with propriety.

G. W. R.—The simplest plan of blackening transparencies for the magic lantern is that in which a dilute solution of bichloride of mercury is followed by dilute hyposulphite of soda, ammonia, or hydrosulphate of ammonia.

SIMPLE SIMON.—Some artists apply water colours to albumenized paper, without giving it any previous preparation, using a little oxgall with the colour. Others, size it first; for this purpose, Newman's, of Soho Square, sell a capital preparation.

AN OLD SUBSCRIBER.—A very weak solution of cyanide of potassium may be used to remove varnish from silver, or silver-plated goods, but a strong solution, possessing some solvent power on silver, might help to remove the plating.

BLACK FINGERS.—An old negative bath, precipitated by carbonate of soda, and then re-dissolved, after washing with nitric acid, will still contain iodide of silver, which is inimical to good tones, &c. The iodide of silver will be thrown down at the same time as the carbonate, and although it is not soluble in nitric acid, yet the strong solution of nitrate of silver gradually formed, as the nitric acid re-dissolves the carbonate, will keep taking up the iodide present. You had better get rid of the iodide first, as we indicated in answering a correspondent last week.

W. H. J.—Your lighting generally is not bad; but you apparently bring your reflecting screen too close to the sitter, or place it at an unsuitable angle, by which you get a strong light in the eye on the shadowed side, which gives a somewhat unpleasant effect to the eye in some. With this exception, the lighting of No. 1 is good; No. 2 it not hardly lighted, but is not sharp; No. 3 is flat for want of shadow, which the reflecting screen seems to have destroyed; in No. 4, there seems to be too much diffused light: the lighting of the others is pretty good. In all the full-length figures, there is a little want of ease in position.

AMATEUR X.—Fading, or discolouration, from imperfect fixation is generally apparent when the prints have been exposed for a few days to daylight at most; very often it shows in yellow mottled discolouration whilst the prints are in the washing water. Nevertheless as a rule 3 minutes immersion is too short a time for the prints to remain in the fixing bath. If, on remaining 10 or 15 minutes the print has lost too much the fault is somewhere else. Possibly the printing is not carried far enough, possibly the negative is very weak, and possibly the paper faulty. 2 The use of the various additions to toning baths of chloride of gold is to facilitate decomposition of the salt, and aid in throwing down the gold; it would take too much space here to enter into the rationale of each preparation employed. Whenever the black powder to which you refer is thrown down, decomposition has already taken place, and the black powder is metallic gold thrown down. See a communication in our last for restoring inert baths. 3. Two drachms of the crystallized salt should be used in the formula to which you refer. 4. If you see nothing of your negatives by reflected light they are either fogged, or too much over-exposed. 5. The negative of which you send a print is under-exposed and over-intensified. The removal of fog from the shadows is not easy: sometimes when there is much reduction in the shadows the application of a weak solution of iodine, followed by cyanide may remove it; but the operation is one requiring experience and judgment. Do not hesitate to ask our judgment without idea of reward. We shall always be glad to help you.

J. W. T. S.—If we were confined to the use of one lens, we should select the triple, as possessing the greatest number of advantages; but if we had another, it should be a view lens, as giving a little more "pluck" and brilliancy with the landscapes pure and simple. Of the two latter you name we should select No. 2. So far as we are at present able to judge, the recently-described wide angle landscape lens is one of the best yet devised.

NELSON K. CHERRILL.—Thanks; we are much interested. The negative, unfortunately reached us very much broken, but we will preserve it as it is. We shall be glad to have a copy of the paper to be read.

T. W.—The cameo portraits you enclose are not an infringement of Messrs. Window and Bridge's design, but they are the same as Mr. Palmer's, which is, we believe, registered.

T. H. W.—We have no information as to the preparation of the paper for Decalcomanie. Our correspondent says that it answers well for photographic printing and transferring the image. Can any of our correspondents give any information as to its preparation?

Received "The Porcelain Picture: with Full Instructions to Make it. By Professor Towler."

"Iron Printing," by John Stone, and several other articles are compelled to stand over.

Several correspondents in our next.

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Photographs Registered during the Past Week.

MESSRS. J. & E. OWEN, Newtown, North Wales,
Three Photographs of "Llew Llwyfo."
MR. J. STUART, Glasgow,
Photograph of Rev. J. Frame.
Six Portraits of Major Smith.
MR. G. R. GILL, Islip Street, Kentish Town,
Photograph entitled "The Way to Heaven."
MESSRS. PRESTON & POOLE, Penzance,
Three Portraits of Rev. B. Field.
MR. P. COLLINS, Plymouth and Clonmel,
Portrait of C. Bianconi, Esq.
MR. WM. HECTOR, Crediton,
Two Portraits of B. Clive, Esq.
MESSRS. W. & E. DOWNEY, Newcastle-on-Tyne,
Portrait of Sir G. Grey.
Portrait of Rev. M. Poynton.
Portrait of Rev. M. Cates.
MESSRS. BECKETT & WILLIS, Scarboro,
Photograph—a Group, "The Game at Chess."
MR. AUSTIN CLARKE, Ripon,
Portrait of Ven. Archdeacon Dodgson.
MESSRS. S. & D. SMITH, Rothesay,
Four Portraits of Rev. J. McLeod.
MR. THOMAS HICKIN, Birmingham,
Three Portraits of Rev. J. C. Barrett.
MR. W. FOX, Sandbach,
Three Photographs "The Welsh Nightingale."
MESSRS. HARVEY & REYNOLDS, Leeds,
Portrait of J. Wilkes Booth.

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THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 349.—*May* 12, 1865.

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THE PHOTOGRAPHIC EXHIBITION.

SECOND NOTICE.

The committee appointed by the council of the Society to superintend the general arrangements of the exhibition, and to award the medals for the most meritorious pictures have completed their work, and rendered a very interesting and discriminating report, which will be found in detail on another page. Six medals were placed at their disposal, without restriction as to the objects for which they were to be awarded; the chief excellence in any department was to be recognized. The committee have, however, awarded seven medals for pictures, and added their unhesitating recommendation for the award of the first of a new medal, to be called the President's Medal, and bestowed as a distinction for meritorious discoveries; and the council of the society has sanctioned their decisions. The medals are awarded as follows:—To Mr. Bedford, Mr. Mudd, Mr. England, Mr. Macfarlane, and Mr. Buxton for landscapes; to Dr. Maddox, for enlargements of microscopic objects; to Mr. H. P. Robinson, for general artistic excellence; and to Mr. G. Wharton Simpson the recommendation of the President's Medal, for his new printing process with collodio-chloride of silver. Considering their recommendation of a very distinctive honour to ourselves, in the shape of the first President's Medal yet awarded, and the handsome terms in which it is done, it seems an ungracious task to challenge in any way the decisions of the committee. For our own part, we can only thank them for the distinction conferred, and the kind words which accompany it; but there is another part of their labours on which it is our duty as journalists to offer one or two remarks. We refer to the impolicy of awarding five medals of equal value for landscapes alone. We should be sorry, indeed, to deprive one of the gentlemen who have received these medals of his honour,—the pictures of all possess a very high degree of excellence, and we do not here question the right of any one of these gentlemen to a medal.

But we submit that in no one instance is the honour sufficiently distinctive. When medals are scattered broadcast they begin to lose value, and that which was originally intended as a special distinction becomes a general compliment. When one medal only in a department is given for the highest excellence, there may be many others in that department nearly as good, and each other competitor may lay the flattering unction to his soul that he is at least second; but where five in one department are awarded, each one of these five may have a misgiving that he is regarded as fifth-rate; whilst every one who does not receive a medal is driven to the conclusion that he stands at best but in a sixth rate position! Thus the system of honorary reward is deprived of its sole excellence; the special distinctions originally intended as a stimulus to exertion, lose their import by becoming general, and more or less of mortification is involved to those who receive and those who do not receive a medal. Where there is but one medal in a department it is no great disgrace to lose it, although it is a great distinction to gain it; but where five are so given it is little distinction to gain, but much mortification to those judged unworthy even of the position of one in five medallists. We do not for one moment charge the referees with any intention to weaken the distinction on the one hand, or increase the mortification on the other. We believe such motive never entered their minds; but they have, we think, by a desire to honour several excellent works, thoughtlessly overlooked the fact that they diminished the honour by every additional medal they awarded.

It is somewhat difficult we must admit, to award the absolute place of honour to landscapes in this exhibition, and we shall not attempt a task which the committee have evaded. In our notice, therefore, of the landscapes, we shall refer to them in the order in which they have come under our notice, rather than attempt to indicate merit by priority. Prominent, however, in position, numbers, and excellence, are the works of Francis Bedford. Rarely have we met with a photographic landscape, which for all qualities of pictorial excellence, equals his view at Bournmouth; soft without tameness, brilliant without hardness, it is a perfect example of good photography. A perfectly defined and forcible foreground stands in bold relief, but without any approach to blackness or hardness, against a fine atmospheric middle distance, and a tender and delicate extreme distance, the whole picture being full of colour. "Glen Lledr" is another charming example of Mr. Bedford's mastery over landscape photography. "A Warwickshire Lane,"—a scene in the neighbourhood of Kenilworth, is another of those pictures by which Mr. Bedford puzzles even skilled photographers. The exquisite luminous character of the picture, is difficult to account for. There is no extreme softness, still less any approach to hardness, but the quality of brilliancy is admirably secured. We commend Mr. Bedford's pictures to the especial study of landscape photographers; he has never been seduced into feebleness or tameness by a desire for factitious softness, he secures brilliancy and softness at the same time by a careful regard to the lighting of his subjects, and not by over-intensification on the one hand, or over-exposure and lack of vigour on the other. Mr. Bedford's No. 1 Triple pictures, will well repay careful examination.

Every visitor to the exhibition will hail the re-appearance of Mr. Mudd, as an exhibitor in the exhibition of the Photographic Society, and will be delighted that his re-appearance has been signalized by a medal. We question very much if a series of such perfect results as these were ever exhibited as produced by any dry process. By the way, we beg Mr. Mudd's pardon for any allusion to the process by which they are produced at all, as we quite agree with his dreaming fancy that it is the brain of the man, rather than the process or the lens, which is chiefly instrumental in producing good or bad work. Nevertheless, it is a question of interest natural to occur to anyone, by what process were these magnificent, and unusually large, as well as unprecedentedly perfect, pictures produced. Most photographers know, of course, that Mr. Mudd stands by his old favourite the collodio-albumen process, and that he now develops, as he has done for years, with plain pyrogallic acid without any free nitrate of silver. His pictures by the No. 1 triple lens, three of which were recently selected by the South London Photographic Society as presentation prints, are admirable examples of artistic choice of subject and point of view, and of delicate rendering without loss of force.

Mr. England exhibits a fine collection of his very fine views of Swiss scenery, taken on 9 by 7 plates, a size which has been somewhat neglected of late. Mr. England has shown rare skill in dealing with difficult subjects; Swiss scenery has been too often rendered familiar to the public as hard and snowy in a pictorial as well as a physical sense; but by a judicious mastery over his materials and art, Mr. England has produced some grand representations of Alpine scenery full of gradation and tone. Possibly a little less depth in printing would be more pleasing to the majority of visitors, but altogether there is a degree of uniform excellence not hitherto attained in pictures of this kind. Mr. England also exhibits a frame of stereoscopic pictures of the same scenery, which leave little to desire.

Near to Mr. England's pictures is a frame by Mr. S. Bourne, whose pictures, by the Fothergill process, used to be familiar at exhibitions a few years ago; these are chiefly of Indian scenery, some, being instantaneous, containing cloud effects: they are all by the wet process, and will not maintain Mr. Bourne's reputation as a dry plate amateur, being somewhat heavy and dull. Mr. Macfarlane also exhibits pictures of Indian scenery, which have perhaps spoiled our eyes for any other pictures of similar subjects. The purity, force, and delicacy of Mr. Macfarlane's pictures have for ever swept away the delusion that photography in India must inevitably produce chalky lights, black shadows, and no detail. Mr. Buxton also exhibits some very creditable views of Indian scenery, of which, however, the printing and tone might have been better, as a somewhat greenish-yellow tint in the masses of white sky have a suspicious suggestion of old hypo.

Mr. Annan, of Glasgow, has some landscapes not inferior in either photographic or pictorial qualities to any in the exhibition. His "Dumbarton Castle" is a picture we commend to the careful study of every visitor to the exhibition, as an unrivalled piece of landscape composition. The one peculiar point about it is, that everything takes its proper place in the arrangement of lines and light and shade; witness the dark mass afforded by the jetty against the picturesque castle-crowned hill in the middle distance. "Bonnington Linn," and others of Mr. Annan's large-sized pictures, are also well worthy of attention.

Mr. Blanchard exhibits a frame of instantaneous stereographs, which form a gratifying illustration of the perfection to which this branch of the art has been carried. Street scenes, marine views, crowds of people, shipping, breaking waves, driving clouds, and sunlight effects are all rendered with equal felicity. Mr. Blanchard has united the two requisites for success in this department in a high degree; a fine artistic taste and unsurpassed skill in photographic manipulation; we have, therefore, some of the most charming effects of nature, selected and rendered with a degree of truth and beauty which is all-satisfying.

Mr. Rouch exhibits landscapes and studies of statuary, in what is known as the cabinet size; amongst the statuary are some of the best photographs we have seen of the kind, the positions well chosen, the light well managed, the photography very perfect and delicate. An upright view of a Grecian temple is admirable, the light and shadow being managed so as to produce an unusually beautiful effect. Many of his landscapes are very fine, but in some of them there is a tendency to blackness. Mr. Rimington exhibits a series of instantaneous and marine views, of a similar size, containing some extremely fine effects of cloud and wave. These are, in the main, very fine, but have a little tendency to feebleness.

Mr. Russell Manners Gordon exhibits a series of cabinet views, which we have never seen surpassed. They consist chiefly of views in the Isle of Wight, and include a very wide angle. In these views there is a special novelty of effect, somewhat hard to describe. A perfection of texture, a fullness of light throughout the pictures, which remind one of the finish of a fine landscape engraving, without any sacrifice of the special truth of photography. All the views are, moreover, selected with great taste, printed with great care, and possess fine skies with natural clouds. There is throughout an effect of atmosphere combined with brilliancy not often met with.

Mr. Stephen Thompson exhibits a frame of views in Switzerland, Savoy, and Piedmont, described as intended for book illustration. With the exception that many of them are printed a little too darkly to do them full justice, these are very admirable pictures, the subjects are selected with an artist's eye, and the photography is very excellent. Mr. Brownrigg has some exceedingly fine landscapes of subjects which have hitherto received too little attention from photographers, being chiefly views of Irish scenery. "Torc Lake, Killarney, on an October Evening," is a picture full of poetry, deserving one of the best positions on the line, instead of the lowly corner assigned to it. A fine landscape is exhibited by a gentleman whose name we have not before met with, Mr. W. Atkinson. Mr. Baynham Jones exhibits two good landscapes from tannin plates. Major Gresley has not many contributions this year; one fine picture contains an excellent portrait of himself. The Pantascopic Company exhibit a number of panoramic pictures, which do not strike us as the best productions of this kind they have shown. Mr. Spode has some good landscapes; one has a defect which has, unfortunately escaped his attention—the mottled yellow stains of imperfect fixation in the sky, give too much point to the argument in favour of some new method of printing, in which these dangers would be less imminent. Mr. Nicholson has some good landscapes, one a view of the inevitable Kenilworth Castle, which is, however, by no means one of the worst that have appeared.

There are a few other landscapes exhibited without any special characteristics to demand notice.

THE SOIREE OF THE PHOTOGRAPHIC SOCIETY.

The Annual Soirée of the Photographic Society was held in the Architectural Gallery on Monday evening last, when a very numerous and brilliant company assembled. The evening was in every sense a complete success, the magic lantern, and magnesium light, as well as the excellent display of photographs and architectural drawings and models, lending additional interest to an occasion scarcely requiring any extrinsic aid to give it *eclat*.

Foremost in interest of a scientific character, we may mention the exhibition by Mr. How, by means of the magic lantern, and a powerful oxyhydrogen light, of a choice selection of the unrivalled microphotographs of Dr. Maddox, and the instructive and interesting series of portraits of wild beasts, secured by Mr. Haes, during several months effort in the Zoological Gardens, both of which, as projected on the large screen, elicited the wonder and admiration of a large and delighted audience. Mr. Hart at intervals shed a brilliant light on the assembly and its proceedings, by means of the magnesium wire, burnt in his ingenious lamp; and Mr. Skaife, by means of his pistol-camera, took several good portraits with very brief exposures, also by aid of the magnesium light. A very beautiful piece of cabinet work, in the shape of a pillar revolving stereoscope was exhibited by Mr. Meagher; unfortunately, a fine selection of transparencies by Mr. Blanchard, designed for exhibition on this revolving stereoscope, by some error did not reach their destination. The London Stereoscopic Company exhibited several of Mr. Rowsell's graphioscopes. These and several minor objects of interest each added their quota to the enjoyment of a very delightful evening. Amongst the visitors we noticed the Lord Chief Baron, President of the Society, and many others distinguished in literature, art, and science.

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IRON PRINTS.

A correspondent, Mr. J. Stone, recently favoured us with a sight of some examples of iron printing, possessing a much greater degree of perfection than we have usually seen in such productions, having great softness and delicacy, and a pleasing warm lavender tint. A large picture of a piece of sculpture was very fine. There were also several curious prints without colour, the lights being blotting paper, and the shadows sized paper. Mr. Stone furnishes details of his operations in the following letter:—

Sir,—I have sent some pictures for your inspection similar to those you noticed in your "Replies to Correspondents," and, agreeable to your request, I give you the precise method pursued. I should not have brought them under your notice from any merits in them, but considered that, though failures as compared with silver prints, they might possibly possess some little interest.

I take a piece of Papier Saxe, and, with a brush, I albumenize one end half-an-inch broad, and hang it up to dry. I then coagulate the albumen with alcohol and water. I next soak the sheets in soda and water, 15 grains to the ounce, till they appear like blotting paper. I then finish them, soaking in plain water, changing the water (using boiling water at the last), then hang them up by the two corners of the albumenized end. Float on solution of gelatine, 40 grains to the ounce, 130° to 140°, and hang up to dry. I sensitize in the following solution:—

Sat. Sol. Bich. Potash	1 part
Water...	2 parts.

Adding 15 grains Am. Citrate of Iron to each ounce.

Soak three minutes. I then, after they are drained, put them in frames to dry, and strain tight and smooth. When dry they are cut out and printed, using the upper side of paper; then washed in cold water, several changes, then in hot water, till all soluble gelatine is removed, testing, as far as possible, the water, to see if any solution of iron remains in the paper. When sufficiently washed, I put them in gallic acid (sat. sol. in cold water), when toned, finish with plain water, soaking, and changing the water. If the gelatine did not penetrate to the upper surface, the picture is mottled. If too much is on the surface, the half tones will peel off.

The mounting is troublesome from the contraction of the gelatine being greater than that of the paper, and the whites are inclined to form creases in consequence. Also, there is a tendency to leave the cardboard. I have used a paper called "plate paper," which is very bibulous, and, from its thickness, the picture is not printed through to the back; and the paste will hold as in ordinary prints; but the pictures are then mottled from insufficient penetration of gelatine.

If, whilst the sheet is floating on the solution of gelatine, a part of it should sink, the part which is thus as it were "soaked" will yield a paler print than the part which has been gelatinized by capillary attraction only.

The transparent picture was obtained thus:—Take a piece of the prepared paper (the Papier Saxe blotting paper), and soak it in solution of gelatine, 15 grains to the ounce, 100°, when dry, &c., print rather deep; then wash in cold water, several times changing. Then soak in hot water till all soluble gelatine is removed. When dry, float with printed side uppermost, on very thick gum arabic, till it appears on the surface, and lights are transparent; then hang up to drain. A very thin paper answers best. Before gumming, try them on *water* to see if all soluble gelatine is removed, and dry them again before floating on gum.

They can be coloured by soaking them in weak solution (5 grains to the ounce) of persulphate of iron, *well washing*, then in sat. sol. gallic acid (without letting them get dry first).—I am, Sir, your obedient Servant,

John Stone.

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COLLODIO-CHLORIDE OF SILVER ON OPAL GLASS.

BY G. WHARTON SIMPSON.*

The method of printing on opal glass by means of collodio-chloride of silver is the most simple in practice, and the most satisfactory in result of any process for the purpose with which I am acquainted. For producing transparencies either on opal or plain glass, or mica, it is equal in result, and simpler in detail, than the various processes of producing transparencies by development, whilst for pictures by reflected light it gives vigour, brilliancy, and delicacy, not easily otherwise attained. The short notice at which I undertook, at the request of the committee, to bring the subject before this meeting, does not, I regret, permit me to do more than state very briefly the means employed for producing the specimens on the table without entering into the various modifications of which the process is capable. But the details I shall state are such as have given me uniformly successful results.

The collodio-chloride of silver is prepared, with some slight modifications, very similar to that I have used for printing on paper. To each ounce of collodion are added:—

Nitrate of silver	7½ grains
Chloride of strontium	2 ,,
Citric acid	1 grain.

It will be seen by those who remember my formula for collodio-chloride for printing on paper, that there is a little less free nitrate of silver, and a little more chloride than I used for paper, and in each ounce of collodion a grain of citric acid. If the collodio-chloride prepared for paper were used on glass, the image was wanting in vigour, and, moreover, the nitrate of silver was apt to crystallize on the surface in drying. Slightly reducing the proportion of nitrate of silver, and adding citric acid, produced just the condition for giving satisfactory vigour on glass. The use of citric acid to give vigour was suggested some months ago by a gentleman who prefers to be known as "The Photographer's Assistant." It gives vigour in printing on paper, but appears to retard toning. On glass it produces no such result, toning going on rapidly. Possibly, there may be many substances which would produce a similar vigour; but at present this answers satisfactorily.

The collodion contains equal portions of ether and alcohol; the amount of cotton varying with its quality. Of the sample I have been using, six grains give a satisfactory collodion. It is as important here as in printing on paper, that the collodion should be one drying free from all opalescence or opacity before the sensitive salts are added. Some of the specimens on the table are produced by a sample of collodio-chloride prepared by Messrs. Mawson and Swan expressly for printing on glass, and it answers exceedingly well, especially with a vigorous negative.

The various kinds of opal glass give widely different results, some of which are peculiar and interesting. One sample ground perfectly flat, but not polished, having indeed a surface like fine ground-glass, and from which I hoped to secure some fine effects, I have not been able to use at all, and have lost several good pictures by trying it. All goes on well until the drying, and then the film invariably splits up into ribbons, although the same collodion on polished glass has shown no such disposition. Very singularly, moreover, it has happened in some cases that a distinct image remained imprinted on the ground opal glass after the collodion had split away.

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* Read at the North London Photographic Association, May 3rd.

The glass giving the most satisfactory results is a thickly flashed glass, of pure white surface, ground and polished. This, whilst leaving something to desire on the score of colour—a warmer or more cream-like tint would be better—answers in all respects perfectly. With the samples of collodion I have used, which are somewhat contractile, an edging of varnish or dilute albumen has been found necessary, to prevent the film leaving the glass in toning, fixing, &c. I have not found any especial pains in cleaning necessary; a hasty rub with a tuft of cotton wool and a little alcohol being the only cleansing employed, and, in many cases, merely rubbing the surface of the glass, as it came from the dealer, with a clean cloth, has been found sufficient.

The glass I have mentioned gives an exceedingly delicate and pleasing surface, and a very brilliant-looking picture. The same glass, before it is ground and polished, having a smooth but slightly granular surface, gives for some pictures a very fine effect, having somewhat the appearance presented by a rough drawing paper, very suitable for large heads.

Another sample of glass of an entirely different kind, being a pot metal, white throughout, instead of flashed, has given some very curious results. It is beautiful in texture, good in colour, and promised exceedingly well; but, from some cause, of the exact nature of which I have not yet satisfied myself, it does not yield such brilliant pictures with the same sample of collodion, and from the same negatives, as the flashed glass; and what is not less odd, the prints seem to possess an amount of softness and delicacy of gradation not to be found in other impressions from the same negative. The prints so obtained are admirable as transparencies, but lack force by reflected light, the image appearing to be actually sunken into the glass. At first, I thought that this was due to the translucency of the material, which, like ivory, required backing with some white material to give the lights their due vigour; but on trying this, the prints were still found wanting in force. I then thought that the collodion must have become decomposed and gave an opalescent film, which caused the sunken-in effect. But the same collodion on other glass was all right, and a fresh collodion on this glass still gave the same soft sunken-in-looking pictures, by reflected light. The cause really appears to be in the translucency of the glass: there is no white reflecting surface to form the lights of the picture—the light passes partially into the glass instead of being reflected from its surface. In some cases this is strikingly illustrated; the black portions of the picture, being actually on the surface, reflect light from that plane, whilst the lights being in the glass, as it were, appear beneath the darks, which in some cases, when viewed with a strong light, actually cast a shadow on the lights beneath. The pictures have an exquisitely delicate and diaphanous effect, and are perfect as transparencies, but they lack some degree of force, compared with similar pictures on the flashed glass.

After the plate is coated with collodion, and quite dry—I prefer to finish before the fire, so as to secure perfect safety—it is placed carefully on the negative, and, in my practice, exposed in a common printing frame. In some cases I have, by a little contrivance, managed to examine them without any displacement; but in most cases, I have relied very much upon judgment, or guess. With a negative without any veil or deposit in the deepest shadows, I find it possible to form a very accurate judgment, by watching the darkening, and when the deepest shadows appear bronzed, I find the whole picture sufficiently done. With negatives having no bare glass, even in the deepest shadows, no indication of progress can be seen, and it is necessary to rely solely on personal judgment, based upon a knowledge of the negative. I find the exposure to be somewhat less than is necessary with paper prints. In some instances I have found an exposure of five minutes in sunshine sufficient: whilst with a very opaque negative an hour has been required. I find that it is wiser to over-expose than to under-expose, for two or three reasons. In the first place, a dark picture on opal glass has more transparency and delicacy, than a dark print on paper; in the next place, whilst if the impression be too light it is useless, if it be too dark, it makes an excellent transparency; and finally, it is possible to reduce an over-printed proof on opal glass, with cyanide of potassium quite successfully. Here is a specimen, which, having been forgotten, was over-printed to blackness in its highest lights; after toning and fixing, it was still like the portrait of a negro. A strong solution of cyanide of potassium was applied, and in a few seconds it was reduced to a reasonable depth.

When printed sufficiently—and I may here state that I find just about the same amount of over-printing necessary, as it is usual to give the albumenized paper—the print is toned by any of the alkaline gold toning solutions; the only condition necessary being that the solution should be very dilute, and it is better old, as the toning generally goes on very energetically, and it is easy to over-tone.

The fixing is effected with hyposulphite of soda, one ounce in ten of water; five minutes are sufficient for the operation of fixing. A few minutes thorough washing under a tap are sufficient to remove all the hyposulphite. The tone deepens considerably on drying.

The same process, printing deeply, gives on plain glass or mica very fine transparencies for the magic lantern, or other purposes. It is probable, as Mr. Swan has suggested, that a valuable method of reproducing negatives may be found in this method of printing. Some further reference to this method of printing on other substances must be reserved for another occasion.

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PRINTING BY DEVELOPMENT.

BY A. LIBOIS.

You have requested me to give an account of the photographic printing process by development which I usually employ, and which has been recently published in the *Bulletin de Photographie Hollandais.* It will afford me much pleasure to satisfy you, but in the first place, I must state that I do not offer this process as an innovation, the idea of which belongs to myself; on the contrary, I admit that it is only after being inspired with the ideas of the eminent chemist Hardwich, and after having recourse to the suggestion of Mr. Carey Lea that I have arrived at the results I now obtain.

As this process is but little known as a whole, and still less practised, yet it appears to me to present real advantages over that generally employed for printing upon salted paper by the action of light, and as it may prove useful in many cases to those who occupy themselves with photography. I make no apology for communicating it.

The fundamental idea of the process consists in associating citrate of silver with the chloride of that metal, to form the sensitive film. Chloride of silver alone is too sensitive to light, and the proof becomes fogged in the gallic acid bath. Citrate of silver alone is too little sensitive to the action of light, and the proof which contains no other salt of silver will give but a very poor result after development. The union of the two salts forms on the contrary a very sensitive compound, which perfectly sustains the action of the developing bath, and ultimately gives very fine results.

I employ thin *papier Saxe,* and float it, for a minute, upon a bath of the following mixture:—

Rain water	100 parts
Chloride of ammonium	2 „
Citric acid	2 „

I dissolve the citric acid separately in a small quantity of water, and completely neutralise it with bicarbonate of soda. I employ 5 grains of the latter to 3 grains of citric acid. I thus obtain a solution of citrate of soda, which I add to the water containing the chloride of ammonium. The solution must have a slight acid reaction, which is accomplished by adding a few drops of a solution of citric acid. I usually stir a little boiled arrowroot into the bath. The final tint of the proof gains considerably by it, especially if we do not have recourse to toning with salts of gold.

The paper withdrawn from the salt bath is suspended to dry, after which I float it for half a minute upon a silver bath, strength 5 per cent., acidified by the addition of a few drops of citric acid solution. It is to be remarked that the first drop of this acid introduced into the bath, gives rise to a precipitate of citrate of silver, which is immediately dissolved upon the addition of the succeeding drops, which also indicates that the bath is sufficiently acid.

We may also employ a silver bath of 2 per cent., in which case the paper must be allowed to float a minute.

The paper is hung up to dry near the fire, or elsewhere, but protected from the light. It will keep good for an indefinite space of time, in a box with chloride or calcium. The exposure to light beneath the negative rarely exceeds 1½ minute even in a bad light, such as we usually experience in December and January.

The exposure is usually from 30 to 40 seconds in the shade, and one-half less in the sun. The time of exposure to the light may be regulated by progressive change of tint in the proof. Usually I stop the exposure at the lilac tint. Experience is better than any specific rule, and it is quickly acquired.

The exposure finished we carry the pressure frame into the dark room, and there withdraw the proof. If the time of exposure has been sufficient, the picture will be perfectly defined upon the paper. To impart to it the requisite vigour, it is immersed in the following solution:—

A	Rain water	16 ounces
	Pyrogallic acid	7 grains
	Citric acid	7 „

I employed this bath constantly during several years, but now I employ the following, which is preferable on account of its superior cleanliness, and the facility of manipulation:—

B	Rain water	16 ounces
	Gallic acid	2 grains
	Acetate of lead	1 grain.

To prepared this second bath, I have solutions of gallic acid in alcohol and of acetate of lead in water. The first contains 1 drachm of acid to 4 drachms of alcohol; the second 1 drachm of acetate of lead to 100 drachms of water. I put 8 drachms of the alcoholic solution, and 105 drachms of the acetate of lead solution into 16 ounces of water, and add a drop or two of glacial acetic acid to dissolve the slight precipitate of gallate of lead that is thrown down, and then the bath is ready for use. It is not necessary to filter it.

We can immerse a great number of proofs at once in the same bath. I sometimes put in 20 or 30 large ones.

There is no inconvenience in putting the fingers into the solution to remove the proofs. The development takes five or six minutes. It must be performed out of the daylight, but the progress may be watched by the light through a frame of yellow glass, strongly illuminated. A little diffused light penetrating the place where the developing is going on causes no inconvenience. The bath remains limpid until the operations are concluded, if we take the precaution to employ a clean porcelain or glass dish, which, in fact, is indispensable. It is advisable to rub it with a little tincture of iodine, and then rinse it before employing it. The development must be stopped just at the point when the picture appears to be finished, for it loses no detail in the fixing bath, and some details, which are imperceptible at first, come out distinctly when the proof is finished and dried.

If we do not wish to tone the proof, it is immersed in hyposulphite of soda upon its removal from the developing bath. The hyposulphite bath I employ is of the strength of 30 per cent., the picture remaining in it about four minutes, and then washed for an hour in running water. Thus far, the colour of the proof is red: upon drying, it assumes a fine deep brown tone, which is, in many cases, satisfactory. If the picture is to be toned, I employ the usual gold toning solution:—

Water	16 ounces
Chloride of gold	7 grains
Hyposulphate of soda	30 „

Upon withdrawing the proof from the developing solution, it is immersed in salt water, and allowed to remain in it four or five minutes: it will not be injured if allowed to remain in it longer. It is a good plan to rinse the proof before putting it into the toning bath, although it is not absolutely necessary. By warming the bath solution to 70° or 80°, the toning proceeds more rapidly, from one to two minutes, being sufficient. Upon removal from the gold solution, the proof is immersed in the hyposulphate, then washed, and dried as before.

Upon removal from the gold bath, the proof will be found to have taken a beautiful tint, and is clear and vigorous, with much transparency in the shadows, the white of the paper retains all its original purity.

I recognize the following advantages in this process:—

The proofs are, at least, as beautiful as those taken on salted paper. I can print a good many even in the darkest days of winter. The cost is much less than those obtained with chloride of silver.

This process is superior to every other for the reproduction of plans, maps, engravings, &c.

It also possesses the advantage of giving good proofs from weak negatives.

I think it will be found perfectly adapted for the enlarged proofs taken with Dr. Van Monckhoven's apparatus.—*Bulletin Belge de la Photographie.*

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PHOTOGRAPHIC EXHIBITION—REPORT OF THE EXHIBITION COMMITTEE.

The committee appointed by the council of the Society to award the medals to those pictures in their exhibition they thought worthy of receiving that honour, and to superintend the arrangements of the exhibition, beg to make the following report:—

Your committee have pleasure in congratulating the council on the numerous and beautiful pictures which form their exhibition, and which are equal to, and in some instances excel, those of any former year, notwithstanding the numerous photographic exhibitions open in Dublin, Berlin, and elsewhere, and which must have absorbed a large number of the best productions of the year. Although the available space has been somewhat limited, sufficient room has been afforded to enable them to do justice to the many fine works sent for exhibition in every branch of the art. Your committee regret that one of the most important applications of the art—that of reproduction—is not adequately represented; and they also remark that portraiture, in its conventional and routine aspect, forms a less prominent feature in this exhibition than in those of former years. Coloured miniatures are not numerous, but some very excellent specimens are exhibited, one by Madame Brunner, a member of the Society, may be especially mentioned as worthy of attention.

Landscape photography has taken the lead in quantity, and there are so many landscape photographs of such great excellence, that your committee have felt bound to award no less than five medals to that department alone. Each of the exhibitors in this department produce pictures so essentially different from each other that they must not be considered as to their relative excellence. Prominently must be mentioned the wonderful series contributed by Mr. Bedford, whose marvellously beautiful transcripts of English and Eastern scenery have been the admiration of all photographers, as well as the public, for many years; while those by Mr. England, although of a smaller size, deserve no less praise—his series of views in Switzerland far surpassing anything that has ever been done before in that country. Your committee have therefore awarded to each of these gentlemen a medal. Two gentlemen, Mr. Buxton and Mr. Macfarlane, exhibit views taken by themselves in India. These pictures are so different from any which have been produced in that country, and exhibited as specimens of photography in India, being free from the chalky high lights and black shadows hitherto regarded as inseparable from the results obtained in tropical climates, that the committee felt it would be injustice to give a medal to one without making a similar award to the other: each of these gentlemen, therefore, has been awarded a medal. To Mr. Mudd, as the ablest exponent of dry-plate photography in the exhibition, the committee have awarded a medal. This gentleman has worked out the process of M. Taupenot with a commendable degree of pains and assiduity, and has obtained results commensurate with the excellence of the process, and the care and skill brought to bear upon the method to which he has devoted himself, his large pictures especially having an amount of force, free from much of the hardness which has usually characterized the pictures obtained by dry plates, which is worthy of attention.

To Mr. H. P. Robinson your committee have also awarded a medal. The artistic excellence and unrivalled beauty of Mr. Robinson's portraits and compositions claimed their undivided admiration, and occasioned them no trouble in arriving at a decision. Some difficulty might have been experienced, however, if they had been called upon to decide to which of Mr. Robinson's productions the highest merit belonged; his portrait studies possess a beauty of an unconventional kind, rarely attained in photography, while his pictorial compositions stand unapproached in their kind. Particularly they would call attention to his "Lady of Shalott," a picture which, whilst it has appeared in other exhibitions, has not before appeared in one of those of this Society. It is an attempt to illustrate in photography Tennyson's well-known poem, with the poetic thought and quaint originality of the pre-Raphælites, and is a curious illustration of the plastic power of an art asserted by some to be purely mechanical.

The series of microphotographs taken by Dr. Maddox, and exhibited by Mr. How, are so superior to anything of the kind hitherto produced, and so free from the defects which have hitherto characterized the enlargements of microscopic objects, that your committee were unanimous in awarding them a medal; they seem indeed to inaugurate a new era in the scientific applications of photography, and, whether regarded as triumphs over mechanical difficulties or results of the highest educational and scientific interest, are alike of the greatest value and importance.

It will be seen that your committee have awarded seven medals; but five of these having been, in their estimation, almost imperatively demanded by the excellence of the landscape photographs exhibited, your committee hope that the council will have no difficulty in exceeding by one the six originally placed at their disposal.

Your committee are glad to report that the exhibition contains some important illustrations of new processes, and fresh applications of the art. Foremost amongst these is the new process of printing by Mr. Wharton Simpson, by means of a new preparation which he has named "Collodio-chloride of Silver," a detailed description of which was read at a recent meeting of the Society. Some highly praiseworthy specimens of this process, both on paper and opal glass, are here exhibited; and from the excellence of the specimens already obtained, and from the extended applications which they understand Mr. Simpson has in progress, your committee have no hesitation in suggesting to the council the award of the President's Medal[*] as a suitable recognition of the value of this process, and the liberal manner in which it was given to photographers through your society, unfettered by patent restrictions.

Mr. Swan exhibits specimens of his carbon process of a larger size than his former ones; but it is with some regret the committee observe that the beauty of his earlier productions has not been maintained, and it would lead them to hope that this may be the result of the want of pleasing negatives rather than any radical defect in the process.

The wonderful advance made by Major Russell in dry-plate photography will be brought before the Society at their next meeting; the specimens here exhibited surpass in excellence all specimens hitherto shown, but had not arrived in time to be considered by the whole committee together.

The productions of Mr. Pouncy have excited much discussion of late. Your committee are happily relieved from the necessity of a lengthened comment thereon: they simply invite the attention of photographers to the examples hung in the exhibition, from which they can form their own estimate of how much has been achieved, and how much yet remains to be done.

Some fine examples of the photographic enamels of M. Lafon de Camarsac are exhibited by Messrs. Marion and Co. The beauty and interest of these specimens are sufficient to cause your committee to regret that the details of their production are preserved secret, and therefore precluded from that consideration from the Photographic Society which they would otherwise have obtained.

The burnt-in photographs of Mr. Joubert, are by a modification of his patent process, and, for the reason just alleged in regard to M. Camarsac, preclude extended consideration. They are, however, very beautiful.

Mr. Griggs has a frame of specimens of photographic block-printing, the details of which, your committee express a hope, will be made public at a meeting of the society.

A frame of pictures produced by the aid of the magnesium light, is contributed by a member, Mr. A. Brothers, of Manchester.

Mr. J. E. Palmer exhibits specimens of an interesting application of photography, in the shape of enlargements by the solar camera on canvas, ready for the hands of the painter.

Mr. Russell Manners Gordon exhibits some examples of landscape photography in cabinet size, embracing a very large angle, and having rare delicacy and atmospheric effect. Mr. Annan, of Glasgow, has also some very fine landscapes. Mr. Rimington has some fine cabinet pictures of clouds and instantaneous views. Mr. Valentine Blanchard exhibits a series of instantaneous stereographs, chiefly marine subjects, possessing combination of water, shipping, and moving figures, with some unusually fine effects of clouds.

Of the limited number of portraits exhibited, those of Messrs. Claudet and Jeffery merit attention.

The combination photograph, "Our Society," by Mr. Twyman, representing a musical society in practice, although not a complete success, is full of promise, and leads your committee to expect some more valuable contributions from this gentleman to our exhibitions of future years.

Admiring the enthusiasm of Mrs. Cameron, the committee much regret that they cannot concur in the lavish praise which has been bestowed on her productions by the non-photographic press, feeling convinced that she will herself adopt an entirely different mode of representing her poetic ideas when she has made herself acquainted with the capabilities of the art; no sacrifice of pictorial beauty being demanded by nice attention to skilful manipulation, and care in the selection of properly adjusted optical instruments.

Card portraiture is well represented. A degree of uniform excellence has been generally obtained in this direction.

It cannot be denied that some of your older members have scarcely kept pace with the onward progress of the art; and, in making this allusion, they do not do so disparagingly, but to stimulate to greater exertions.

Signed on behalf of the committee.

JAMES GLAISHER, *Vice-President.*
H. W. DIAMOND, *Secretary.*

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A PHOTOGRAPHER'S DREAM.

BY JAMES MUDD.[*]

The Professor resumed his seat amidst general applause. When that had subsided, a member, whose name I found was Mr. Dryman, wished to remark that the "revolver" camera, alluded to in the Chairman's address, must not be confounded with a photographic weapon of a similar name, which had been in existence some time. He (Mr. Dryman) had never seen anything taken by it, neither had he ever heard of anyone who had. He believed it was a sort of photographic popgun or pistol.

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[*] At a meeting of the council held in 1863, it was resolved that a medal should be struck, to be called the "President's Medal," having on the obverse the likeness of the president, the medal to be given at any time to those whom the president and council shall deem worthy of reward for any remarkable discovery, improvement, or application of the photographic art, or other meretorious object connected therewith.

[*] Concluded from p. 214.

Mr. Wetun understood that it had been discharged successfully by the inventor, but did not go off so well in other hands.

Mr. Lonso thought that the introduction of this kind of weapon in duelling would be a great improvement upon the ordinary and more fatal instrument; for, instead of taking each other's lives, the combatants would only take each other's portrait.

Mr. Wetun: And the *satisfaction* consists in each man making his opponent as ugly as possible.

Mr. Messo had a little matter to lay before the society. He had been experimenting a good deal on a new process, which, if it could be carried out, would have advantages. It was this: Take the usual materials for plate-cleaning, coating, exciting, developing, and fixing; mix them all together in a bottle, and, after violent agitation, pour the mixture upon the plate, in hope of securing the whole of the processes at one operation. He must say he had, so far, failed, but it was not for want of perseverance; for he believed no man had ever got into such terrible difficulties, or made more awful muddles, and come out alive. Without exaggeration, he had gone on with those experiments many times, in such a state of extreme personal disfigurement, through getting the "stuff" upon him, that he was sure his own mother wouldn't have known him.

The extremely dejected and piebald appearance of this daring experimenter excited the sympathy and commiseration of the members, as he wearily resumed his seat.

Mr. de Veau had often been inconvenienced by the reversal of the image, when taking portraits in the camera. He had hit upon a method of doing away with that difficulty. It was so simple, that he was only surprised it should have been left for him to make the discovery. He merely reversed the sitter, placing him head downward, which, of course, brought him right side up in the camera.

Mr. Askew explained a little apparatus he had made for taking views round a corner. The lens was the chief novelty, the rays of light being bent as they entered. The instrument he used in bending them was ordinary pair of pincers.

This apparatus engaged the attention of the assembly some time; and all agreed that it was impossible for the human mind to conceive a higher state of French polish than the woodwork portion presented. It was a triumph, and was the work of one of the humble members of the Grand Focus Photographic Society. The inventor showed specimens produced by this camera. There was a peculiar lustre and brilliancy about them that was attributable to the polish so much admired.

A member introduced the subject of elation or blurring, and a lively discussion was soon got up, but did not make much progress, as each speaker generally meant something else from every other speaker, and thus the debate was chiefly remarkable for a want of clearness, and the frequency of misunderstandings. One gentleman, of a rather ruddy countenance, called the effect spoken of more a *doubling* of the image, and said he had frequently seen it in nature. He particularly remembered, on two occasions—once after spending an evening with some hospitable friends, and again in full daylight, after a wedding breakfast, he had noticed a peculiar confused blurring or doubling of objects, caused, he believed, by elation. And if so, in nature, he reasoned, it must be so in transcripts of nature by photography. This seemed reasonable, the subject dropped, and the Chairman called upon Mr. Muffe to read his paper on a method of ascertaining the amount of angle of view any lens would include.

That distinguished member rose, and gave the following description of the plan:—

Take a long pole (if you can get one, if not, never mind, it will do just as well without), and place it in the foreground, at an angle (any angle, in fact), and then draw a line—a common clothes-line will do—from the pole to a post in the distant horizon. Put pegs at distances of every half-mile; now shut one eye, and try to discover the plane passing through your optical axis, taking care to discourage any luminous rays from passing that way alone. Now draw another line—this time an imaginary one, at right angles with the other, and on this steadily fix your imagination. Then gently rotate the eye from one peg to the other, along the whole line towards the horizontal plane, which is placed perpendicularly by means of a powerful telescope in the direction of the wind. Now set in motion by means of a treadle, worked by the foot, an apparatus for agitating the rope. By this the line is strongly vibrated, the vibrations being registered by an index. Dividing the vibrations by the length of the pole, and again by the distance of the pole from the horizon, the remainder may be of some use in helping you to decide. You have now only to remove all the things, unpack your camera, screw in your lens, and look on the ground glass, and you will see, at once, how much of the view the lens will include.

When the description was finished, the apparatus was carefully examined by the members, and much admired for its complexity. The inventor, in reply to a member who wished to understand it, said he felt somewhat proud to assert that he did not think it possible fully to describe or comprehend the intricate clockwork rope vibrator; indeed, he did not blush to say that it was only imperfectly understood by himself.

The Chairman complimented the inventor, who in reply intimated his intention of making an automaton figure to go through the usual photographic process, by clockwork and other mechanical means.

Professor T. M. Foole wished to call attention to the human eye, and the impressions left upon it by the last object it chanced to rest upon in life. He had taken an eye from an Egyptian mummy, and had succeeded in restoring it to a moist and soft condition; and then had photographed and enlarged the image. It was quite a success. The photograph was exhibited, and showed a group of Egyptian figures in fierce combat amidst the dust of the desert, with the pyramids in the distance. The owner of the eye had evidently fallen in this encounter. Encouraged by this success he (the Professor) had experimented on the other organs of the senses. He had subjected the tongue of the mummy to microscopic examinations, but had failed to discover what it had had to breakfast on that unfortunate morning which had proved its last. He was more fortunate, however, on inspecting the nasal organ, for he had undoubtedly discovered a powder, which had all the appearance, and much of the pungency of, "Prince's Mixture." (Some of the powder was handed round to the members. Many of them "took a pinch," and as violent sneezing was the result, it was generally believed to be veritable snuff). Professor Foole continuing, said, that on examining the tympanum of the ear, some markings were clearly distinguishable. They were in the Egyptian character. He had showed them to a learned student of that ancient tongue, who, after examining them, showed much reluctance to communicate their meaning; and, at the same time, was moved with an unseemly mirth, which broke at last into most indecorus laughter. He (the Professor) after a suitable rebuke, which somewhat restored the gravity of the scholar, found that the words translated into the English tongue meant, "you jelly old fool, there's one for your nob!" These, therefore, were the last words that caught the ear, doubtless spoken by his foe, as the fatal blow was struck which ended the earthly career of the ancient Egyptian. But in those words he (Professor Foole) was sure his hearers with himself, would fail to discover any cause for the mirth exhibited by the learned translator. On the contrary, was it not a solemn thing to be addressed familiarly and personally, as it were, by a voice silent these five thousand years? Before sitting down the learned Professor would mention one other little matter he wished to draw attention to. It was a well known fact that the gold and silver solutions used in the ordinary work-rooms of photographers gave off a certain amount of their bulk in the form of vapour at the usual temperature of the atmosphere, and that that vapour combined with all the objects in the room. Now, all that could be secured by simply setting the room and its contents on fire, and searching for the precious metals amongst the ruins. He had reduced to ashes his rather handsome and very complete laboratory, and had been rewarded by obtaining the ·007201 of a grain of pure gold, and a trifle more of silver.

After the Professor had ceased, there was quite a rush of members who wished to occupy the attention of the meeting. One rose to describe an apparatus full of cranks, and taps, and handles, and wheels, and springs; another to explain somthing else with ropes, and pullies, and bands, and straps, and strings; a third to introduce a process with phosphates, and sulphates, and nitrates, and carbonates; and yet one more with his prisms, and foci, and axis, and angles, untill. I was bewildered and gave up all attempts to follow or understand. At last a member handed round some specimens of a new printing process which, he said, he had discovered; upon which another member rose to say that it was not new, for he had done the same thing long ago, and a warm discussion took place.

Now the specimens produced were of such an imperfect, not to say hideous, character, that it would have been sufficiently astonishing to have found *one* man willing to call them his; but here were *two* individuals claiming these miserable bantlings as their own. And, so, as the friends of each claimant to the discovery joined in the discussion, there was considerable animation, which was rendered still more piquant by many personalities of a sarcastic or facetious character.

In the confusion and noise, I found myself on my legs, vainly endeavouring to make myself heard, for I felt an almost irresistible desire to say a few words. At last, there was an interval of comparative silence, and I got an opportunity of saying:—"Well, I declare, gentlemen, I did expect better things of you in this age of the world. Why you are no better than we were in the nineteenth century. I am sure I could find, in the journals of that time, precisely similar sayings and doings. I had a copy (feeling in my pocket)—yes, I had a copy of *The British Journal* with me to night, I mean—last night—well, no, in 1865, I really—but oh! here it is! Instead, however, of the crisp, rustling, paper, I drew forth a soft, limp, brown, tinder-like substance, on which I could just—for a moment—distinguish the old familiar title, and then it crumbled away, and there fell to the floor some dust! Ah! I thought I could have shown you how we used to get on some centuries ago; but, no matter—I only wish to say that, like ourselves, you seem pretty well off for tools; that you have plenty of contrivances, abundance of everything to assist the mechanical part of photography, but, like ourselves, you do not seem to talk much about using them intelligently. You have everything, surely, required to take marvels of photographs, but these same ingenious machines will work as willingly upon a wretched subject as upon a good one—upon an ugly brick wall as upon a lovely landscape; and, therefore, you have to direct and apply them to worthy objects. Knowing this, one would have expected that your learned discussions and papers would have turned upon composition and the rules and principles of art, so that this knowledge, added to photographic skill, might guide you in your choice of subject, and enable your eye to see what to adopt and what reject. But I have not heard a sentence this evening on this important subject. Nothing seems to be done to cultivate this taste by spreading information on the question; and thus, while attention is exclusively directed to what is simply mechanical, that which gives immense value to photographs is neglected. The appliances, processes, and contrivances are not to be despised or under-valued, thanks to those who thus add to our convenience, and contribute to our success in that way; but there is artistic knowledge required in using them. They are but tools, as the brush and the colours and the palette to the painter; and can never take the place of the guiding hand or the thinking brain. It is not brushes and paint that make pictures; it is not processes and cameras that make photographs. In ancient times, gentlemen, during the short intervals of leisure from my other duties, I used to steal away, with camera and plates, to the hills and valleys, and there, I do remember well, my patient search for the picturesque, climbing hill slides, leaping from stone to stone in rugged water-courses, breasting through tangled underwood, mounting rocks, crossing rivers, anxious to find those lovely nooks which are so often only met in secret and hidden places; for nature, hiding away her most beautiful things, only reveals them to those who lovingly and earnestly seek them. And, having found, how I hovered about them! viewed them from this and that point, and have gone round about them, and returned to them again, and have waited for the light, and feared the weather (often disappointed in both)! and have been full of anxieties and care! But my pains rewarded, the beautiful pictures now my own, I have joyfully shown them to my brethren, and often I have waxed wroth to hear the questions—"What process were they taken by?" "What lens *did* them? or, "What collodion *took* these pretty scenes?" Process! lens! collodion! Why, are there not, gentlemen, in your day, as in ours, twenty processes, twenty lenses, twenty collodions, that would take views equally well, *the subject being first found?* Worthy subjects are scarce, but they must be searched for and found, or vain will your process be, however perfect—your lens, however good—or your camera, in all its pride of polish, however ingenious, I suppose, gentlemen, you have your dryplate men, who turn out for a day or two to *do* their six dozen views. We had. Yes; and they filled them too, and so added to the mighty heap of rubbish, which brought disgrace upon photographers, and their art. Nature does not show her loveliest things to such careless seekers; and if she did, they could not see, for they have not the educated eye to discern them. These are the mechanical workers, who believe that processes, lenses, and apparatus make pictures. Let the honourable member who just now hoped to make an automaton go through the ordinary processes, pause in his work; for there will be no originality in it. Let a knowledge of art be spread amongst you by means of these societies, then will your learned chairman and yourselves, gentlemen, find the artists begin to appreciate photography, and to recognize in it almost a rival to the productions of their pencils. Then will you look upon apparatus and processes as secondary to ——; but, here I raised my arm, pointing to the pile on the table near where I stood, and, catching accidentally a projecting handle with some violence, the whole mass came with a tremendous crash to the floor, causing a cloud of dust to rise, which, tickling my olfactory nerves, I gave a mighty sneeze! On opening my eyes, which, of course, were momentarily closed during the effort, every soul had vanished, and I found myself sitting shivering before an almost fireless grate, catching cold as fast as possible, at my own home, having just kicked over the fire-irons.

I need not add how soon I was in bed; but I could not forget for some time the queer mixture of things I saw and heard in my

PHOTOGRAPHIC DREAM.

ABOUT LIGHT, AND ABOUT LIGHTING THE SITTER;

With some Reflections about the Room in which he is Lighted.

BY JABEZ HUGHES.*

"About Lighting the Sitter."—So much has been said and written about lighting the sitter, and so much has been done in the way of lighting him, that it is time we changed the subject and began to think about *shading* him. I think, if anything, he has been over-lighted; I am sure he will be very thankful if we can furnish him with gentle shadow, and he will be eternally obliged if we can relieve him from the horrors of the glass room. Fortunately, a sitter is not such a rarity that we need put him in a glass case. The very term *glass* room encourages the idea that an indiscriminate amount of light should envelop the sitter. It has been sufficiently established, that a room mainly built of glass is not only not needed to take portraits in, but that it is one of the worst rooms for the purpose. It is hot in summer, cold in winter, wet in rainy weather, and dirty all the year round. That those "who live in glass houses shouldn't throw stones" is right enough; but I don't live in a glass house, and I don't believe in a glass house being a photographic necessity, and the sooner the notion is dispelled the better, I think, for the art and its practitioners. Therefore I throw stones—brickbats and slates I should prefer—and I hope I shall break many of the panes in the conventional glass room and get them replaced by these more fitting materials. It is sufficient that there be reasonably large windows by the side and over the head of the sitter, and all the rest of the room should be in literal darkness. A room constructed on this plan differs but little from an ordinary artist's studio, and is the best adapted for securing the greatest amount of useful light without losing half-tone and modelling. The windows should, if possible, look to the north, and should be so surrounded that neither the morning or afternoon sun should shine in. If all these advantages cannot be secured, the nearest approach to them possible should be attempted, and each person so far as his local circumstances will permit should avail himself of the general principles.

It is curious that many photographers have an aversion to studying this subject—the best mode of lighting the sitter—viewing it as foreign to photography, and as generally ending in a eulogium on art, fine art, high art, the arts generally, with a back-handed blow at photography as the dirty Cinderella of the arts. I fancy I hear such a one saying—"Ah, I had an artist come to me one day with a sitter, and he would arrange the light and pose; and of all the abominations you ever saw, that was one of the worst. I hate artists," he continues, "they give themselves such airs, and pretend to know such a lot, and all the while they know nothing at all about it."

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* Concluded from p. 212.

I admit that artists do sometimes give themselves more consequence than their knowledge of photography warrants; but this can be no reason for the photographer displaying equal illiberality by turning up his nose at art.

But the question is many-sided, and perhaps enough was said about it, from the artist's stand-point, at an earlier period. Let us walk round our subject, and look at it from another point of view; let us see if, judged by the light of common sense, some hints for improvement may not be gained from every-day experience. What is the verdict of the world as to photographic portraits? "That they are never flattering, seldom favourable, and rarely pleasing." (Of course *we* think different, but that's by the way.) Suppose we ask the public why they put this harsh interpretation on our labours; the answer will be, "that we exaggerate their blemishes, decrease their beauties, and always make them look older."

Of course *we* know this is all wrong, but let us suppose for argument's sake that there's some truth in it, and suppose we humour the public by debating the point. Let us suppose some of us professionals are in our reception room, an ordinary well lighted apartment where our specimens are rather tastfully displayed. In comes a middle-aged, intelligent gentleman,—he sat for his carte de visite only last week,—and after the usual salutations, we plunge into the subject on our mind; Now, sir, do you join in this general out-cry that is being raised as to the unsatisfactory nature of photographic portraiture?

Mr. Public rejoins, "Well, I think there's some truth in it."

"What, photographic portraiture, or the outcry against it?" we ask.

"The outcry against it of course."

(This was not the answer we expected, but never mind, we'll keep our temper.) "Well, as we know you are not a person to hold an opinion without having a reason to support it, perhaps you will kindly tell us why you think our portraits so unsatisfactory? It's quite a new idea, I assure you."

"I don't allude to yours in particular;" is the reply, "my remarks apply to the whole fraternity. My principal objection to a photographic portrait is, that it is not a true and natural one."

"Not true and natural!!"

"Allow me to explain. I complain that you photographers have adopted an artificial method of representing people. You always put a black patch under the nose, I see it in all your specimens here, and it's the same everywhere else. Then there's always one side of the face very white, and the other very dark."

"Oh that's the shade, the shade; ask any artist—"

"I am not an artist, and I know nothing about art, but I am only explaining why I and others object to your portraits. Remember you began the discussion, and I am only trying to answer your question.

"Beg pardon I'm sure; pray go on, highly delighted. Quite interesting I assure you."

"Well, I was about observing that I do not see the necessity that people should always be represented with a black patch under the nose, this dark side to the face, the black shadow under the eye-brow, the semicircular black lines under the eyes, the patch of white on the top of the hair, the — —,"

"But you forget that unless these shadows were there, we could not take your portrait at all."

"That's what I expected you would say; and it confirms my remark, that your portraits, therefore, are neither true nor natural."

"But ——," (We are getting quite hot now).

"Excuse me, I've not done.—I saw a portrait of you here just now; here it is—come nearer the window; I am looking now at just the same view that the portrait shows, and I wish to compare your appearance as I see it in fact, and as it is represented in your photograph; I will begin at the top. Your black hair is very fairly shown, only there are two or three large patches of white that I don't understand, and don't see the necessity to be there; I'll pass to the forehead. Your own, as I look at it now, seems to be round, with some phrenological bumps, but in the photograph it is quite flat, and no bumps, unless that black mark is to represent one, though it looks more like a bruise. Your eyes seem very well done."

"I am glad you found something to be pleased with."

"Oh, yes, the eyes are very fair; they are hazel in nature, but you have them here as jet black, but, perhaps, that's near enough. I suspect if they had been blue or grey, they would have looked as if you were blind. But why is that black patch under your brow? I declare it's blacker than your eye-brow itself. Then your nose! it certainly is not the same shape here that it is nature, besides that abominable snuffy patch under it, just the shape of a little cocked hat. Your whiskers appear to me both the same in colour and shape, but in the photograph one is grey, and the other—well I can't see the other, for it and the black side of the cheek are so mixed up, that they look like a bit of black sticking plaster, and the stray hairs look like the ragged ends."

"Oh! I can't stand this any longer," we now exclaim, "It's perfectly absurd. You forget that I stood in quite a different light when that portrait was taken, and you are condemning it, because it's not like me when I stand in *this* light. Why you must think I am an idiot to stand and hear you go on like that. I don't want to get out of temper, but just come upstairs to my glass room, and I'll prove to you what nonsense you have been talking."

(We go upstairs.) "Now, sir; this was where I stood when that portrait was taken, and it is supposed to represent me when I stood so, in this light. Now look at me, and then look at the portrait, and see if you don't recognise all the markings, the lights and shades—the everything, such as it is there. (I was getting down-right warm, and I thought it was high time I should speak out.)

"Well, I must confess you are right. As you stand there, the portrait certainly does wonderfully resemble you."

"Of course it does. You see people shouldn't talk about what they don't understand." (He had been walking into me pretty strong, and I thought I'd let him have a bit of my mind.)

"I did not finish what I was saying. I acknowledge that the portrait does resemble you up *here* a great deal better than it did down *there*, but as I had always seen you down stairs, I naturally would prefer to see your portrait as you look there. You see I don't know the reason why you insist on coming up here and putting yourself in that violent light. It certainly don't improve you, for if I saw one wrinkle in your face down stairs, I see twenty up here. In this place you look anxious and haggard, and certainly ten years older."

"But you must consider——"

"Allow me to continue: I made the remark just now that photographic portraits struck me as being neither natural nor true, and you seemed startled."

"I should think so indeed!!"

"I think I now see the reason. Your portraits are not true and natural, because you do not represent people as they see each other: but you bring them up here and place them in this strong light. They wink and blink their eyes, and have all sorts of markings and shadows on their faces, that are only seen when they are up here, and which by the way, never seem to improve them; and while in this artificial condition you insist on taking their portraits. I can see the reason now why my friends are so dissatisfied with my portrait, and why I look so old and disagreeable."

"But, Sir, just listen——"

"Excuse me, I will look in on another occasion and hear your reply; but now I must bid you good day, but before I go let me say, that so long as you gentlemen find it necessary to put people in such a dreadful light as to make them look older and more ugly than they naturally are, depend on it they will not visit you any oftener than they can avoid, and will begrudge the money they pay you. But if you can only make them at least as good looking, and as pleasant looking, *and* as young as they really are, your business will be a more prosperous one. This, it strikes me, you will never be able to do until you abolish that strongly lighted room. If you could only take your portraits in such an apartment as people are in the habit of seeing each other in, and when the lights and the shadows are the same as they are daily seen, and where the appearance and expression of folks are of their usual pleasant and cheerful character, then, and not till then, will your portraits be quite true and entirely natural.——But, excuse me, perhaps I am wrong; you gentlemen ought to know best. At any rate I must go now. Good day."

"Good day, good day, Sir——. What an original to be sure! Very singular ideas! It strikes me the old gentleman got rather the better of me in the argument. I'll think over what he said. I think he's more than half right.—Just struck me! I know what's wrong. Too much top light! Too much front light! Too much light altogether!!——"

From the above fancy sketch it will be seen, that, even by the homely test of every day experience, to say nothing of the voice of Art, the ordinary method of "lighting the sitter" by turning on the usual glass-room blaze, is as unsatisfactory in practice, as it is indefensible in principle.

That some good will arise from the discussion of this subject, is the earnest wish of those who love photographic portraiture, and wish to see it stand higher in public esteem.

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Proceedings of Societies.

London Photographic Society.

The usual monthly meeting of the Society was held on Tuesday evening last in King's College; Mr. Glaisher, Vice-President, in the chair.

The minutes of a former meeting were read and confirmed and the following gentlemen elected members of the Society: MM. J. A. Rowland, A. W. Rimington, and Netterville Briggs.

Major Russell then read a paper on the tannin process, detailing its history and progress. The most recent step consisted in his discovery that dry plates prepared with bromide of silver and tannin could not only be developed but intensified without any application of free nitrate of silver, by the proper use of ammonia in development. The paper was mainly devoted to a history of experiments and statement of capabilities than with exact formulæ, these Major Russell stated depended on so many conditions which could only be ascertained by observation and experience, that it was difficult to lay down absolute rules. The nitrate bath, should not, however, contain less than 60 grains to the ounce, and should be freely acid with nitric acid. The collodion might vary in quality, but the bromide it contained should not be less than twice the weight of the soluble cotton, nor more than five times the weight. He exhibited some excited plates prepared with a bromide only, in order to dispel a notion that such films were necessarily thin and transparent, those exhibited being creamy and opaque. He also exhibited a number of negatives, instantaneous and otherwise, to show that the negative was free from any kind of deposit, the image, however dense, being quite in the film, the surface being not dead but bright and polished looking. Notwithstanding this, there was the curious fact that the image seemed in different degrees of relief, a circumstance which, in ordinary negatives, was generally due to the piling up of silver in development. He also showed that in some instances a white image, something like a collodion positive, could be obtained by this mode of development without any nitrate of silver. Some of the negatives he had produced in a fraction of a second.

After some general conversation,

Mr. Hughes, in response to the Chairman, was happy to bear his testimony to the assiduity and patience of Major Russell in a field which he had had almost exclusively to himself. The fact that in order to experiment in the same direction everything required preparing especially, was doubtless a barrier to the experiments of many. If the bromide process could be worked with wet plates and with the materials ready to hand, doubtless they would have had the experience of many to aid them in coming to conclusions. With himself, this was the fact: on occasions when, perhaps, he was disposed for experiment and could spare time, everything required to be prepared, and so the matter stood. It was natural with many to be anxious to see results at once without waiting for the delay involved in drying. Probably experiment might be conducted in this way; he saw no reason for dryness; in point of fact, it could be only a question of degree, for dry plates were not absolutely dry, and he should think it very probable that the process could be tested by using the plates wet, which would induce many to try it. In the paper he recently read, his object had been to give a process for working tannin plates with everything just as it was prepared for wet plates. To test Major Russell's recent improvements, and avail themselves of the promised advantages, photographers must now provide themselves with the requisite materials. He hoped they would do so at once, and not, like himself, postpone the experiments *sine die*.

Mr. W. Warwick King asked whether Major Russell had tried iron development with tannin plates, and if he had had any experience as to the keeping powers of the plates after exposure and before development.

Major Russell had tried iron and found it answer to a certain extent, but as iron and tannin made ink it did not seem a very desirable way of working, and he did not go on with it. As to the keeping qualities he could not give very precise information. He had, however, tried some experiments in this direction, from which he had found that, if the plates were kept after exposure, say for a month, they ought to be exposed half as long again as if they were to be developed at once, as the invisible image appeared to commence to fade slowly out during the time before development and after exposure. In reference to the question of Mr. Hughes as to the possibility of working his process wet, he could not say anything, as all his experiments were undertaken with the view of perfecting a dry process. It was probable that as a wet process his would not be better than that in ordinary use. As to the sensitiveness, he could now prepare dry plates which were more sensitive than wet collodion with pyro development; and about the same, he thought, as wet plates with iron development; but these, of course, were variable in sensitiveness. Major Russell then exhibited some specimens to illustrate blurring, and his mode of getting rid of it.

The **Chairman**, in proposing a vote of thanks, said that gratitude should be in proportion to the value of the gift, and the time bestowed upon it. Major Russell had, for the last four or five years devoted himself to this process, advancing from month to month, in each knowing more than he did before. He hoped he would continue to progress. His results were already very fine; instantaneous groups of cattle were almost more than they might have hoped for as results from dry plates. The paper was one containing almost too much to grasp in merely listening to it, and he was not surprised that there was no discussion, but they would have the opportunity of reading it in the journal. He now put the vote of thanks, which was carried by acclamation.

The **Chairman** then read a letter from Mr. Ross, sent with some specimens taken with his doublet lenses, one of 11 inches equivalent focus, and another of 9 inches equivalent focus. A stop of 1-50th of the focal length had been used in order to test for flare. The Chairman had examined the pictures and they were very fine and quite free from flare. Mr. Ross promised a paper on lenses, during the session. The Chairman also read a letter from Mr. How accompanying some specimens by M. Saché by the globe lens. He also called attention to some charming large instantaneous pictures of the British Fleet by Mr. Hughes. A vote of thanks to these gentlemen was then passed.

The Chairman then announced that the Council had sanctioned the recommendations of the Committee appointed to award medals who thus obtained an act of indemnity for their decision. Referring to the Exhibition he thought that considering the number of other exhibitions of a similar kind open at the same time, and the short notice, it had been very successful. He then announced that Mr. Pettit's paper would be read next month, and he hoped that it would justify the promise given of it last month.

The meeting was then adjourned to the second Tuesday in June.

North London Photographic Association.

The usual monthly meeting was held on the evening of Wednesday, May 3, Mr. W. Hislop, F.R.A.S., in the chair.

The minutes of a former meeting were read and confirmed. Mr. W. Davis was elected a member of the Society.

The Chairman stated that the special meeting announced last month would be held first.

Mr. W. W. King moved, and Mr. Bockett seconded, a resolution to the effect that the meetings of the Society should be held from October to June, instead of from September to May as heretofore.

The motion was carried unanimously.

Mr. Davis, late of Nelson, New Zealand, then exhibited a number of prints of New Zealand scenery, from tannin plates, which were examined with great interest. In reply to various questions, he stated that the plates were prepared with Ponting's collodion, coated with a 10-grain tannin solution, slightly washed afterwards, and, in many instances, developed with a 60-grain solution of protosulphate of iron, no especial washing being given to the plate to remove the tannin before applying the iron solution. The small pictures (about 4½ by 3½) were taken with Dallmeyer's No. 1 B with the smallest stop by two (⅜ths of an inch), with an exposure of about two minutes. The long pictures (8½ inches on base line) were by the front lens of the same combination.

After an animated conversation on the subject, a vote of thanks to Mr. Davis was passed.

Mr. Springham, of Romford, exhibited and explained some improvements in the camera and camera stand, which he had found useful. The dark slides possessed an ingenious arrangement by which all light was prevented from entering through the groove wherein the sliding shutter moved. A large camera was used without a base-board, by the sliding body being supported by means of bars sliding in grooves at the side of the camera. The camera stand had ready facilities for attaching the camera, and for pointing and fixing it in any required position or inclination. The following is Mr. Springham's description of the camera stand:—

"This invention is applicable not only to cameras but also to telescopes and other instruments requiring horizontal and vertical motion.

"It consists of the ordinary iron triangle, to two corners of which are fixed two pieces of iron curved towards each other, and each having a horizontal slot through it, in which moves a little iron foot attached to the front part of the camera. The other angle of the triangle has a horizontal extension, in which is cut a vertical curved slit. In this slot works a curved screw, having two flat sides, and which can be moved either vertically or horizontally in the slot, and secured in any position by means of two nuts running on it. This screw is attached to the hinder part of the camera. The curves of the three slots and the curved screw have all one common centre, which enables them to work together.

"The advantages of this camera stand are as follows:—

"It is much lighter than any other camera stand, having similar motions, hitherto brought before the public.

"It has great freedom from vibration, being attached to the triangle at the three angles immediately above the legs.

"The camera may be attached or detached from the stand almost instantly, but can never come off or moved by chance.

"The motion is so easy that a camera requiring two men to place it on the stand can be pointed in any direction by a slight touch of the finger, and as readily fixed immovably in any position."

After some conversation, in the course of which Mr. Springham said he had used some of the apparatus in the table for 13 years, a vote of thanks was passed to that gentleman.

Mr. G. Wharton Simpson then read a paper on "Printing with Collodio-Chloride of Silver on Opal Glass" (see p. 219). A number of specimens on opal and plain glass, and mica, illustrating the statements in the paper, were laid on the table, and examined with much interest.

A desultory conversation on the subject followed, in reference to silver stains on opal glass.

Mr. Goslett suggested the use of equal parts of sulphuric acid and water for removing the most obstinate stains on glass.

Mr. H. Cooper, referring to the use of citric acid with the silver bath for albumenized paper, had met with results he had not anticipated. He made a 60-grain bath, and neutralized it with ammonia, and then added three or four grains of citric acid to each ounce. Instead of securing great vigour, as he had anticipated, the pictures were beautifully soft, and the paper very sensitive, but toning slowly.

Mr. Simpson said this experience was singularly opposite to that of Mr. Frank Eliot, who found the use of citrate of silver a great aid in securing vigour.

Mr. Foxlee had tried citric acid in ordinary printing—he found no advantage; the prints came from the frame very red, and toned very slowly.

Mr. Simpson had found that citric acid added to his own collodio-chloride increased vigour.

Mr. Cooper asked if Mr. Simpson had used a preliminary coating of albumen in trying the collodio-chloride on glass.

Mr. Simpson had done so. The plates were a little more sensitive, and the image a little more vigorous, but the final surface was not so pure and spotless as when the uncoated glass was used.

The Chairman had had considerable experience in the use of preliminary coatings of albumen. He used at one time to filter very carefully, thinking that it was necessary in order to to secure a clean film. He now kept a stock of the preparation, the white of one egg to ten or twelve ounces of water, and he flushed the plate with a large quantity of it, and allowed it to flow off; he found that by this means he secured a clean film without trouble.

After some further conversation,

The Chairman announced that medals would be awarded at the Photographic Department of the North-London Exhibition, both for pictures and apparatus. He hoped that all the members would do their best to secure a worthy display of the art. Photographic pictures had, moreover, been removed from the manufacture into the fine art department.

The Chairman then announced that, at the next meeting, Mr. Burr would read a paper "On the Application of Photography to the Continuous Self-Registration of Magnetic and Meteorological Phenomena at the Royal Observatory at Greenwich."

The proceedings then terminated.

Photographic Notes and Queries.

The Past and the Present.

Sir,—The contributor, who so kindly reviews once a month the events you have chronicled once a week, quoting a remark of mine in the last number of the *Art Student*, has no right to insinuate what he dares not assert. The word "quondam" does not yet apply to either my love of, or esteem for, photographic art. The simple fact that I protested against the classification first adopted by the committee of the North London Photographic Association, when he was not only silent concerning it, but was also a member of that very committee, will suffice to prove my assertion. I am glad to find that, if your contributor, and his fellow committee-men, did eat humble pie, they have been induced to disgorge it, even at the eleventh hour, and after they had advertised largely the obnoxious classification which photographers received with such strange apathy and indifference.

While on the subject of that article, may I also record my vote in favour of Mr Hughes's idea of lighting the sitter, and in opposition to the antagonistic opinion, your aforesaid contributor expresses. I think the latter mistaken, and believe the proof of his being so, may be found in by far the larger number of his portrait productions. A portrait cannot be too *soft*, although it may be flat and tame, and, moreover, although hardness may be obtained without brilliancy, the latter, quality is seldom obtained without softness. Yours, &c.

THE EDITOR OF THE ART STUDENT.

[Our correspondent falls into several errors in his letter, through regarding his own conjectures as facts. He speaks of our contributor, the writer of the "Echoes," as a person whom he knows. Under any circumstances, he could only guess at the personality, and ought not to deal with his guesses as facts; but in this case, he is doubly wrong, as the gentleman who contributes the article in question was never a member of any committee which classified photography amongst manufactures; nor had the committee of the North London Photographic Association anything to do with that classification. A general exhibition having been projected by a general committee, photography was classified as stated. The North London Photographic Association were asked, after this classification was made, to take charge of that department; they accepted the trust, but protested against the classification. This protest met with a proper response, and the classification was altered. A mistake was rectified; but humble pie was neither prepared nor eaten by anyone. On the subject of lighting, our confrere also commits two errors: he assumes an antagonism between our contributor and Mr. Hughes as to the mode of lighting the sitter, a subject on which they are entirely at one, both as to the exact form of studio, and mode of using it, the only question between them being, as to the wisdom of building with the minimum quantity of glass, with which it is judged possible to work; or to build with a maximum quantity, a portion of which is to be shut out with blinds, and held as a reserve force for especial use. As to the mode of lighting and form of glass house, they are agreed. Further, as our correspondent does not know the "Old Photographer," he cannot know his works, or deduce any argument from their character. With the remainder of his letter, we have the pleasure of agreeing.—ED.]

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Talk in the Studio.

INSTANTANEOUS PORTRAITURE.—We received a few days ago, from Mr. James Ross of Edinburgh, some interesting examples of rapid exposure, depicting figures in motion, jumping, swinging, &c. They are a little under exposed, and some slightly moved, but very striking illustrations of rapid exposure, when it is remembered that the figures are only a few feet from the lens.

THE DUBLIN EXHIBITION.—The London Stereoscopic and Photographic Company have secured the exclusive right to photograph in the Dublin Exhibition. The splendid series of views published by the company of the International Exhibition of 1862 afford a sufficient guarantee that this important work, the results of which will be still more interesting to future times than to the present, will be performed in the most satisfactory manner. At the opening of the exhibition, by the Princes of Wales, on Tuesday last, the artists of the company took many successful negatives both of the scene outside the building, and of the inaugural ceremony, including portraits of the Prince of Wales, the Duke of Cambridge, and the illustrious company assembled.

ROYAL PATRONAGE.—We are pleased to notice that Mr. Jabez Hughes has again had the honour of taking photographs of her Majesty and her Royal Highness Princess Beatrice, at Osborne. On this occasion, he succeeded in obtaining several equestrian portraits of her Majesty, which are intended, we believe, to assist Sir Edwin Landseer in a portrait he is about to paint of the Queen.

PHOTOGRAPHY AND ILLUMINATION.—Mr. Ordish has just issued a series of very well designed outlines for illumination, ornamented with some fine photographs. We can strongly recommend them to all interested in the charming art of illumination.

MONUMENTAL PHOTOGRAPHY.—Prince Lucien Buonaparte's well-known interest in ancient British dialect is illustrated by his erection of a monument to Dorothy Pentreath the last who spoke the old Cornish tongue. Mr. Brooks, of Penzance, has just received a commission from the Prince to produce photographs of the monument.

"SOMEBODIE COMIN" AND "SOMEBODIE COME," are, Mr. Ross informs us, titles he gave to a pair of studies in February 1863; so the title is not borrowed from Mr. Robinson's "Somebody Coming." The coincidence is curious, as both gentlemen have hit independently on exactly the same name for *genre* pictures. We are glad to do Mr. Ross the justice of making this explanation of what otherwise looked like poverty of invention as regards title for a very clever pair of pictures.

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To Correspondents.

THE "EBURNEUM" PROCESS.—In the letter of Mr. Burgess in our last, he recommends varnishing the collodion film to check the tendency of the finished picture to absorb moisture. By a printer's blunder, the word "burnishing" was substituted for "varnishing" in each case where it occurred. The sense would, however, suggest to most readers that varnishing was meant.

J. M.—It is possible that the film drying dull may arise either from the use of an unprepared sample of paper which allows the collodion to sink in; or, more probably still, from the use of a sample of powdery collodion, which has a tendency to dry dull; or possibly, in adding the sensitive salts to the collodion, you have also added water, which would tend to produce the dead surface you describe.

INQUIRER.—With a space of 30 feet by 13 feet you can erect a very excellent studio. We should prefer the ordinary ridge roof, sides and roof all glass, except five or six feet, at each end, opaque. The side which gives you a north-east light will be best for the principal light on the sitter.

J. S. C.—It is somewhat difficult to form much opinion of your system of lighting from the group enclosed; but, so far as we can judge, the mode of lighting is not bad. After a negative is completely developed and washed, you may fix it in white light without injuring it. The mode adopted by the cheap copying companies is to work in large quantities, copying several cards on one negative, so as to economize both that process and printing. There is no mode of making such copies as perfect as the original. The cheap system is a bad one, and injurious to the art in many ways.

L. M. L.—The specimen you enclose is similar to Mr. Palmer's quinque gems. How far your prior use of the design would be affected by Mr. Palmer's registration we cannot tell. It is a question for a patent lawyer. 2. We believe that the copyright law forbids the production by amateurs of copyright designs; but, as a rule, there is no conviction for piracy without a proof of sale. 3. The picture enclosed is pretty good, but lighted a little too exclusively from one side. A trifle more exposure, and less intensifying would give more modelling. 4. We cannot tell you; we know *a* best; but have no reason to doubt the respectability of either. 5. We have sometimes met with such markings with an old collodion in an old bath; perhaps the same collodion in another bath may not give the same markings, nor another collodion in the same bath. 6. We should think the space marked × in your diagram better opaque. 7. Prepared chalk is pure carbonate of lime.

ONE WHO STUDIES THE NEWS.—It is tolerably clear that little good can be done with the glass room in its present form and position. Your projected alteration will be a great improvement. Let it be 26 feet long, and have a little more glass top and sides than you at present suggest. 2. You may sensitize by floating the paper; the object of brushing it is to avoid the necessity of a large dish, &c. For development, turn up the edges of the paper so as to form the sheet into a dish. It is not a good plan to immerse the print for development. 3. The face of the negative should be next the copying lens in working with the solar camera. 4. It is, no doubt, possible to get a condensing lens and the material for making a solar camera yourself; but we cannot tell you where. We will attend to your request.

O. P. Q.—Shellac is bleached by means of chlorine. The resin is first dissolved in caustic potash, and chlorine is then passed through the solution. You can purchase the bleached lac better than you can prepare it.

E. W. P., Swansea.—The glass you enclose is non-actinic, but it is very dark, and would exclude a great deal of light. We regret that our engagements do not permit us to answer such questions by private letter.

R. P. H. N.—There is no simpler shutter for rapidly uncovering and covering the lens than that known as the flap shutter, in which a hinged piece of wood is rapidly moved by means of a pinion with the fingers. 2. It is possible to develop with iron in the field and leave intensifying and fixing until you get home. The film must, however, be kept moist; equal parts of golden syrup and water will answer the purpose.

W. J.—You cannot do better than procure the equipment you mention. Amongst dry processes there are several good; the most certain we know is the collodio-albumen process, as worked by Mr. Mudd; but the preparation of the plates require time and care. The tannin process, as worked by Mr. Hughes, is very simple and certain. The manual of the latter gentleman you will find very useful. Also "Practical Photography," parts 1 and 2, published by Negretti and Zambra. In using the front lens of the combination to which you refer, the object is to produce views on a little larger scale, where rapidity is not such an object. It has, of course, a longer focus than the combination.

W. BARTHOLOMEW.—Thanks for your letter, which shall appear. We quite agree with you as to the worthlessness of the florid style of picture you enclose.

ONE WHO HAS PAID HIS TWO GUINEAS.—The chief part of your argument being based on the occurrence of a printers' error will, of course, fall to the ground. As the process is now public property, and everyone can try for himself, without much trouble or cost, it is unnecessary to occupy further space with the discussion.

R. T. W. (Monmouth.)—We do not know anyone who finishes enlarged photographs in crayon, except Mr. Wall, who used to accept such commissions, and, we believe, does so still. Thanks for your kind offers.

ROSA.—The spots in your prints are due to imperfections in the paper.

ONE IN DOUBT.—The negatives are somewhat in fault, having been under-exposed, and, perhaps, a little over-intensified. It is probable, however, that better prints might be obtained from them with a more highly-albumenized *Rive* paper.

Several Correspondents in our next.

Registrations have been duly attended to, and will be specified next week.

THE PHOTOGRAPHIC NEWS.

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DEVELOPMENT WITHOUT NITRATE OF SILVER.

The fact of chief novelty and importance in Major Russell's interesting paper read at the last meeting of the Photographic Society is the possibility of securing sufficient intensity in a tannin negative, prepared with bromide of silver only, without the employment of any nitrate of silver in development, by the employment of pyrogallic acid and ammonia. After the detail is sufficiently brought out by the ordinary alkaline developer, instead of adopting the usual plan of employing a solution of pyrogallic acid and nitrate of silver, a strong solution of ammonia is added to the developer, by which, if other conditions are in harmony, perfect printing intensity is secured.

When, nearly four years ago, we first verified and announced the possibility of developing a latent image without the presence of free nitrate of silver,* the statement was met with incredulity in many cases, and direct denial in some. The valuable discovery of Mr. Wardley, as applied by Mr. Mudd, in which the latent image of a collodio-albumen plate was developed by the application of plain pyrogallic acid, without silver, was not considered a satisfactory proof of the fact in question, as it was probable that some trace of free nitrate remained in the plates. We accordingly tried the plan of development with a solution of plain pyrogallic acid on a variety of dry plates, prepared by ourselves and others. We tried collodio-albumen plates, and Fothergill plates, gelatine plates, and tannin plates, in all of which great care was taken to eliminate any trace of free nitrate, and in every instance an image was secured on development. We next prepared a plate, without any organic matter or preservative of any kind, and washing it first in distilled water, and then in several changes of common water, until we believed all the free nitrate removed, we then made assurance doubly sure by immersing it for a quarter of an hour in a strong solution of chloride of ammonium, and finally washed it thoroughly in several fresh changes of water.

The plate was then exposed wet, but received about the same exposure as a dry plate. A solution of plain pyrogallic acid was then applied, and a perfect, but thin, image slowly appeared, which, on the subsequent application of pyrogallic acid and silver, intensified satisfactorily. We were scarcely prepared for the result, as it was not in accordance with such theory as existed on the subject. One able authority on photography at the time repeated the experiment, evidently under some unknown varying conditions, without securing any image whatever. This, he stated, was similar to the results of a hundred similar experiments, adding "we are satisfied that a thoroughly washed dry plate cannot be developed without silver, and if the contrary should ever appear to be the case, it is merely a proof that the plate has not been *well* washed, and that some free nitrate is entangled with the film." Mr. Shadbolt, at the meeting at which we read the paper, suggested that, as a bromo-iodized collodion was used, and that probably some trace of chloride of silver might be formed by immersing the plate in the solution of chloride of ammonium, it was possible that the chloride and bromide of silver, known to be reducible salts of silver, might have formed the image, and that the iodide had possibly played no part in the matter.

The collodion employed, however, in the experiments in question, contained less than a grain of bromide to each ounce, and the proportion of chloride of silver formed after the thorough washing must have been infinitesimally small, if any. Believing, at the time, that iodide of silver without free nitrate was insensitive to light as well as unreducible by it, we came to the conclusion that the presence of a mere trace of a sensitive and reducible salt was sufficient to set up the necessary action, and that all the salts of silver contained in the film were reduced to form the photographic image.

In all our subsequent practice with various kinds of dry plates, we have always employed, first, a solution of plain pyrogallic acid, as we believe many others have done, and with undoubted advantage. In the further progress of Major Russell, in which he not only obtains an image without nitrate of silver, but secures sufficient intensity, it is manifest that the film must contain a sufficiently good body of the silver salt to be reduced to begin with, and the use of a highly salted collodion will necessarily be imperative.

In this matter practice, as Dr. Vogel recently well said, still keeps in advance of theory. Our own early experiments disputed at the time, not unnaturally, now receive striking confirmation, but still remain unexplained. Pure iodide of silver, so long believed to be so insensitive to light that calotype paper prepared with it might be exposed to sunlight without injury, or rather with some unknown or scarcely understood good, is now stated by Mr. Carey Lea, after careful experiment, to be really, in some degree, sensitive to light. This, for a moment, seems to be at variance with Dr. Vogel's recent discovery as to the mode of rendering sensitive the unsensitive iodide. It is quite possible that further experiment will prove the two to be in accordance. Dr. Vogel's theory is in accordance with various other facts with which we are familiar, and will, we doubt not, soon receive further practical confirmation. In the meantime it is a matter on which we may congratulate photographers, that whilst the practice of the art progresses so well in the hands of the amateur, who makes it a pleasure, and the professional photographer, who makes it a business, the theory of the art upon which, after all, the most satisfactory practice must eventually be built, is not left uncared for, but is the subject of careful investigation by untiring and able chemists like Dr. Vogel, Carey Lea, Davanne and Girard, Spiller, Schnauss, and others who have done so much to place photography on a firm scientific basis.

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* See Photographic News, Vol. v. p. 518.

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MAJOR RUSSELL ON RECENT MODIFICATIONS OF THE TANNIN PROCESS.

In his recent paper read before the Photographic Society, Major Russell stated, that his chief purpose was to describe some facts and principles in dry photography, and to give such an outline of his experience as would show how he had been led to his present position. As the paper is somewhat lengthy, we intend to lay before our readers some extracts, giving the most salient points of the paper, instead of reproducing it in its entirety. After some historical remarks he says:—

Tannin has been said to be a sensitizer, and from the result of some recent experiments, this seems really to be the case; collodion, which will scarcely give a trace of an image when simply washed and dried, will produce a good negative when the tannin has been applied after drying the film, but before exposure, while the application of tannin after exposure has scarcely any effect. Many other soluble organic matters have the same property, and it is not improbable that something better may be found; but as yet, I have tried nothing which has answered half as well. The first difficulty in working with tannin was that the film, on being moistened, though it did not blister, expanded and formed wrinkles; this was prevented by a thin substratum of gelatine, which, when partially coagulated by the tannin, held the collodion very firmly to the glass. A simple means of diminishing the tendency of the film to expand was discovered, I believe, by Mr. Bartholomew, that of moistening the film, before developing, with a mixture of alcohol and water.

It was soon found that the presence of bromide in unusually large proportion in the collodion increased sensitiveness, and eventually that a still further increase might be obtained by the use of bromide exclusively. In the course of making experiments in a direction pointed out by Mr. Keene, it was found that washing off the tannin after application increased sensitiveness, greatly diminished the tendency of the film to expand, and did not remove the chemical effect of the tannin. Another discovery, made near the same time, was that of the alkaline developer. * * *.

It would be a great mistake to suppose that ammonia is a developer, except in the same sense that nitrate of silver is so; a mixture of ammonia with tannin, gallic acid, or pyrogallic acid will develop far more powerfully when the last is used. The action of ammonia in this way bears a very close resemblance to that of nitrate of silver. The method just indicated, of using bromide alone, washing off the tannin, and developing with an alkaline mixture, was published before there had been time to test it thoroughly; it worked well at first, but it soon appeared that some condition of success was unknown. During some weeks of constant trial, almost the only difficulty was occasional want of sensitiveness, which was rightly attributed to the insufficient removal of soluble bromide; and it being supposed that none of it should remain in the film, the collodion and treatment were altered a little to make the removal of the salt more easy and certain. The result was, that the negatives were almost always more or less fogged, with exceptions of great brightness and vigour, which made the matter very puzzling. At last, it was evident that the uncertainty was caused by the difference in the duration of the stay in the exciting bath and washing-water, and the conviction was forced on me that bromide of silver is discoloured by a developer, without the action of light, when no trace of a haloid salt is present.

This fact having been proved beyond all doubt, it was necessary to make a careful investigation anew of several questions, especially of those relating to the behaviour of iodide and bromide of silver, and of the soluble iodides and bromides. In these experiments, a pure collodion was used, which would scarcely give a trace of an image when simply washed and dried without nitrate of silver or tannin. The results obtained from many courses of experiments were as follows:—It was found that washing off the tannin gave a real increase of sensitiveness, which was not due to the more complete removal of soluble salt. On comparing the sensitiveness of iodide and bromide of silver, when each was treated in the manner which seemed best suited to it, the iodide proved to be between fifteen and twenty times less sensitive than the bromide, and it was found that the alkaline developer had little or no effect on the iodide; in fact, the image produced in this way was so faint as to be almost invisible, and it seemed probable that it was not produced by any action on the iodide, but on some other combination of silver in the collodion; this point, however, was not tested. When the development of a plate prepared with iodide only was begun with the alkaline liquid and finished with pyrogallic acid and silver, the result was inferior in every respect to that which was obtained by using a silver developer from the first. The iodide of silver did not, as far as it was tried, appear to require the presence of any soluble salt, the negatives being equally bright whatever the duration of exciting and washing. To obtain a tolerably good negative with iodide alone, it was necessary to expose until a visible image of the sky appeared before development; from this it seems likely that the insensitiveness of the iodide may be due to the fact that no known developer is suited to it when entirely freed from nitrate and dried; it is possible that the discovery of some new developer may give us a high degree of sensitiveness with iodide of silver.

Bromide of silver, besides its sensitiveness, has another valuable property: instead of, like iodide, coming out to meet the nitrate, and thus forming a superficial layer composed almost entirely of the silver salt, it is converted where it lies, uniformly, or nearly so, through the whole thickness of the film. This property enables us to use so large a proportion of bromide in the collodion that its contractile property may be entirely removed; and thus any tolerably good soluble cotton will answer, and one of the greatest difficulties in dry photography is avoided. Another result is that no loose layer of bromide of silver is formed on the surface of the film; even with a very large proportion of bromide in the collodion, the surface is always bright when dry, and will bear brushing with cotton wool without showing marks.

For some time it appeared as if a small proportion of iodide of silver was of some service; for one part of iodide to twelve or fifteen of bromide in the collodion gave an advantage in making it more easy to obtain the proper combination of sensitiveness and brightness; it turned out, however, that this effect was entirely due to a trace of soluble iodide, and not to the iodide of silver. * * * A very slight trace of soluble iodide, either in the collodion or introduced in a subsequent washing, gives an advantage, as when present in the right quantity it tends to prevent fog, and is not easily removed by washing. I have been led to suspect that a minute trace of soluble iodide gives some other advantages, but am not certain about this. * * * It appeared also from other experiments that the only effect of iodide of silver in my present way of working is to diminish intensity, and I feel convinced that it is totally inert, as much so as brickdust would be. A moment's consideration will show that this is likely to be the case; for the iodide is not only about eighteen times less sensitive than the bromide, but is incapable of being developed by the alkaline mixture, and the soluble salt required with the bromide still further tends to make the iodide of silver inert. The only useful purpose served by the iodide is to aid in preventing the transmission of light.

The use of albumen to diminish a tendency to spots, as suggested by the late Mr. Glover was then described, a dilute solution of albumen, containing a little of a soluble bromide being applied to the plate, and then well washed off before applying the tannin. Some further remarks on the value of some soluble iodide or bromide in the film in restraining the alkaline developer, and preventing fog, as acid does with the ordinary developer, follow. The exact amount of soluble bromide, and the best mode of securing its presence, can only be determined by experience. The possibility of intensifying without free nitrate is then stated as follows:—

One of the most important improvements made recently is a method of intensifying without nitrate of silver. When the detail is out sufficiently, following the analogy of the ordinary silver developer, strong solution of ammonia, containing a sufficient amount of soluble bromide to prevent fog, may be added to the developer; and, if the film is in the right state, even more intensity than is required may be easily and quickly obtained; when more salt than is necessary has been left in the film, the addition of ammonia to the developer to bring out detail will often at the same time produce sufficient intensity. To obtain intensity without nitrate of silver, the requisite conditions are, that fogging to any extent should not have commenced, and that the layer of sensitive bromide of silver should be sufficiently thick. It is evident that if the film is translucent before being darkened, it will not be very opaque when blackened all through; for in this method no silver can be deposited on the image, which is formed by the reduction of the bromide of silver to the metallic state; at least this appears to be the case by tests which have been applied. This state of things is really a great advantage; for all "piling up" (which often occurs in the ordinary way to so injurious an extent) is entirely avoided.

The facts just described entirely contradict the old theory of development, so far as bromide of silver is concerned; and I have some hope that they may help to explain what the action of light in forming the invisible image and the developing action really are. Should this be the case, the time and labour expended on the investigation of the subject will not have been wasted.

The fact that a certain amount of soluble salt is required with bromide of silver, will explain many curious differences of opinion and practice among dry photographers. The conversion of bromide is so slow (this fact was, I believe, first published by Mr. Sutton) that a large amount commonly remains in the film; for this reason some have found that alkalies, hot developers, &c., were necessary to sensitiveness, whilst others, who by different treatment removed the soluble salt to a greater extent, found that such applications produced nothing but fog. Again, bicarbonate of soda used in the developer requires much more soluble salt than ammonia; therefore some have preferred one alkali, some the other. In my hands, the soda has proved less manageable. Whether bromide of silver in wet collodion requires the presence of unaltered bromide, is a question which I have not investigated, but it is, I believe, a matter of common observation, that wet films containing bromide give a flat and foggy image when kept too long in the exciting bath; it would therefore seem, even in this case, unlikely as it appears, that the same law holds good. Some persons may probably object to keeping a limited quantity of salt in the film, as difficult; the only answer to this is, that in the present state of our knowledge I believe that sensitive dry plates cannot be produced by any process without, knowingly or otherwise, complying with this condition, and that ignorance of it has been the greatest cause of uncertainty in dry photography.

The question of the so-called "blurring" was then referred to, and the use of yellow paint at the back of the negative in preventing it described. Some practical details, which we give in full, then concluded a very interesting paper.

This paper has already extended to so great a length that I cannot, without being unreasonably tedious, give full practical details, but will mention a few of the principle points which have not already been explained. Gelatine should not be used under a porous bromized collodion, nor with a very acid bath. No substratum is necessary; but a thin coat of india-rubber is easily applied, and on the whole saves trouble, by enabling the film to bear rough handling, and to a certain extent conceals slight impurities on the glass. Any tolerably good collodion will answer with a proper proportion of bromide; this should vary with the nature of the cotton; the weight of salt should not be less than twice, nor more than five times that of the cotton. The collodion should set well and firmly; to make it do so, it may require to be salted with bromide of cadmium exclusively; or to prevent its setting too quickly to flow well, it may be necessary to substitute as much bromide of ammonium as will dissolve, for a portion of the bromide of cadmium. It makes little difference what bromide is used, except as regards its effect on the physical state of the collodion. The exciting bath should not be weaker than sixty grains to the ounce; it may be much stronger. By a simple and easy method all the nitrate not actually used in converting the bromide, may be saved and restored to the bath; this should be freely acidified with nitric acid, which facilitates the conversion, and does not diminish sensitiveness after a good washing in common water which contains a trace of a carbonate; the acid has no effect, after complete removal, in keeping the image bright. The only part of the process in which distilled water is necessary, is for the first washing waters after the exciting bath. The best form of ammonia for the development is the common sesquicarbonate; one grain to the ounce is the best strength in a general way to begin with; the mixed developer may be strengthened, if necessary, by adding, drop by drop, a 32-grain solution. Three grains of bromide of potassium in one ounce of the 32-grain ammonia solution, makes a very good intensifier, and may be used, when much diluted, instead of the plain ammonia solution, to begin the development when the plates have been too much washed, or when they are in the proper condition, after a long exposure; this is a good plan in cases where great vigour and brightness are more important than sensitiveness. If the collodion contain a large enough proportion of bromide, it will bear almost any strength of ammonia without being loosened. From not knowing all the conditions, I formerly made a mistake in recommending the ammonia to be poured on the film alone before mixing it with the pyrogallic acid; this treatment makes necessary a longer exposure than if the developer is mixed before being applied, even when the tannin has been dried on and acts as a feeble developer with the ammonia. Ammonia alone has a tendency to diminish the impression of light, and makes the image, when brought out by the mixture, very bright, but comparatively under-exposed. It is a curious fact that bicarbonate of soda, applied alone at first, has, on the contrary, a very powerful effect in causing fog with the mixed developer.

All false theories tend to impede progress; and it is to be hoped that the great sensitiveness of films prepared as just described will dispel the illusion that the presence of nitrate of silver is necessary to sensitiveness. This theory is so entirely contradicted by facts, that it has required the support of another equally unfounded notion, which seems to have been specially contrived for the purpose—that is, that it is impossible or difficult to remove all the nitrate of silver from a collodion film. Now, not only will the salts in common water soon decompose every trace of the nitrate, but under all ordinary circumstances, in films containing bromide, a large portion of this escapes conversion, and must in great part be removed by washing before the full sensitiveness can be obtained. It is evident that the washing out of soluble bromide from the back, through the surface of the film, renders the presence of any trace of nitrate of silver utterly impossible. The time required for the removal of the nitrate in this way, of course depends on the depth to which it has penetrated, and the nature of the film; but, to make sure, it is always best to dip the plates in a solution of bromide when the nitrate has been nearly all washed out with distilled water. The strength of the bromide solution is not of so much consequence, for the salt introduced in this way is easily washed out again. Soluble iodide is a very powerful agent, and must be used with caution; in a wash with or without albumen, before drying the film, or in the developer, from 1-100th to 1-800th grain to the ounce may be about the right strength.

Jottings for 1865.—No. 3.

BY A PHOTOGRAPHER'S ASSISTANT.

Permanency of Collodion.—Value of Organic Matter in Printing, &c.

Photography has amply reciprocated the advantages conferred by men of science that have laboured to promote its growth, by opening up to them new fields for investigation, and extending widely their knowledge of things that have long levied claims on patient observation; chief among which may be named an improved interpretation of optical laws, and a discovery of the mighty power wielded by the imponderable, flashing sunbeam, whose vast influence is daily becoming more apparent; and, as one discovery is rapidly followed by others, they seem to point onwards to a period when the wondrous power developed by light will be recognized in the changes that are ever working out revolutions in the physical form and condition of external matter. In the changes alluded to, atmospheric influence may not be despised, and its hygrometric properties lend material aid that bids mountains shrink before a union of forces, whilst torrents shout a giant roar as they bear the crumbled dust away to plant on other soil, where (by analogical reasoning) we may suppose actinic force steps in to form new combinations, by uniting the constituents of organic matter with the inorganic finely divided atoms.

Speaking of the hygrometric properties possessed by the air we breathe, reminds us of a disastrous influence this power is said, by a writer in a contemporary, to exercise on things photographic, more especially in connection with that "treacherous" substance known as collodion, which is pronounced unfit to occupy a place of trust, by reason of the unsatisfactory information we possess concerning the character of its combinations, and the extent to which a damp atmosphere will act in promoting its decay.

The writer of the paragraph alluded to must surely have had his thoughts fixed on pyroxyline, as it exists before dissolving; for we believe no instance can be hunted up where a collodion picture, if properly manipulated, has succombed to ordinary external influences. We have recently taken some pains to obtain evidence, but have failed to meet with one example of a glass picture fading after due washing, whether protected or not from atmospheric action; and this fact, in our opinion, bids us banish all fears on the new started objection; for, if a surface picture remains in an unprotected position for years uninjured, we might reasonably conclude that a picture formed in, and not upon, a film will stand an equal, if not a better chance; more particularly when we remember *that collodion dried, resists, never courts moisture.*

Mr. Swan, in his batch of ingenious suggestions, naming the manifold uses to which the new collodio-chloride process might be applied, states citric acid to be the best aid in securing vigour, but, at the same time, honestly confesses to the unstable production formed by the salt named. Such, indeed, was our experience when we tried it in our earlier experiments; the reduction occurring in the fixing solution, not in the toning bath as stated by Mr. Swan as his experience, probably because the toning solution we use has little or no bleaching power. By fixing with ten grains of hypo only to the ounce of water excessive bleaching was stayed. This tendency to extreme reduction is counteracted by the addition of some other combination of an organic character; we found a few drops of the French spirit varnish answer admirably, but it caused the picture, when on paper, to crack, and we abandoned its use in favour of castor oil. For opal glass it will perhaps prove useful.

Whilst ingenious labourers, with praiseworthy zeal, are seeking the path that leads to absolute permanency, we are pleased to see attempts made to perfect our present systems of printing. Mr. Palmer has started the novel idea of adding organic matter to the sensitizing solution. A similar suggestion was offered to ourselves some weeks since by Mr. Prestwich of Reading, but seeing no advantage over nitrate of soda to be derived from its adoption, we left the hint untried. Theory quite agrees with Mr. Palmer's practice, so far as vigour and clean baths are concerned, but sensitiveness must be traced to the addition of ammonia, and subsequent fuming with the same substance. In our own practice we study simplicity, and never seek complex methods, when simple means are capable of performing the same quality of work, and having proved nitrate of soda an economical servant we adhere to its use, securing the additional sensibility by fuming. In the modification proposed by Mr. Palmer gelatine satisfies the solvent tendency of the water, and nitrate of soda performs a similar part but on different principles; by both methods silver is saved, and both seem capable of producing good results, with this drawback, one is simple the other complicated. Specimens of one have been favourably received, we offer examples of the other for the Editor's criticism. In the hands of that gentleman we are content to stake the reputation of a process we have so long advocated. But whilst we condemn this organic mixture as unnecessary for albumen printing, we cordially recommend it as the most valuable formula ever published for sensitizing plain salted paper, because it would tend to correct an error that most dealers commit in preparing papers commonly known as plain salted: where a large allowance of a chloride salt is allowed and no allowance made to assist vigour. Some formulas indeed advise the addition of gelatine but the quantity is inadequate to the part it should perform, for we again reiterate in silver printing, vigour is the fruit of organic admixture, and if some organic matter is not supplied it is left to the sizing in the paper to repair the loss so far as its power will extend, which in some samples is not far. Here Mr. Palmers's bath will prove a friendly helpmate, but to secure the best results we counsel a liberal addition of organic matter in the onset: 6 grains of Nelson's gelatine with 8 grains of chloride of ammonium is an excellent formula, whose value a recent series of comparative experiments have confirmed. We scarce need add the solution must be warm at the time of floating the paper. For direct printing in the solar camera the chloride salt might be increased to 30 grains with advantage; as a comparatively small number of solar rays are spread over a large surface, and the same rule applies to this and to ordinary printing, as described in our remarks on Mr. Simpson's process, viz., sensibility depends mainly on the number of atoms offered for simultaneous reduction, we believe 30 grains of the salt named will arrive at the maximum required, the aid of fuming being called in to assist rapidity of reduction.

Unfortunately, our ever-varying climate is unsuited for solar camera printing direct, so that development must be resorted to in most cases, and manifold are the formulæ tendered to photographers that are interested in the matter. To our mind most of them are far too complicated, and not over scientific in their construction: chlorides, iodides, bromides, acetates and citrates jumbled together in empirical confusion, that must raise a smile whenever intelligent scrutiny is brought to bear on them. The principles brought into action are simple, let us then adopt simple formulæ. The pictures should be kept on the surface so far as practicable. Use a hard sized paper and employ gelatine in the same convenient proportion as before named. "We require sensibility combined with softness;" 8 grains of chloride of ammonium, 2 of bromide of potassium will impart both qualities. "Chloride of silver has a strong tendency to fog under development." Curb reduction by adding a liberal dose of acetic acid to the silver solution and developer. Do not fear for hot weather, double the quantity usually recommended will not injure, but will assist in preserving the purity of the whites. Float on a 40-grain bath. Allow the paper to drain and expose whilst damp, the developer will do its work more evenly than when applied to a dry surface. If black tones are required without the assistance of gold let the exposure be short, until a very faint outline is visible, but warm tones for toning will require a little longer exposure, as the dark tints will only appear under a prolonged action of the gallic acid, and as the successful issue of each operation depends on care and cleanliness, we must insist on the due observance of such conditions. The rage for cartes is said to be dying out, and British tastes generally find gratification in extremes, so that it becomes a matter of personal interest for every photographer to put his shoulder to the wheel and endeavour to improve the means of production, so that when the caprices of the public turn in an opposite direction, we shall be ready to leave the land of "Lilliput" and take up our sojourn for a while with the "Brobdignagians."

Note.—Since writing the above we have prepared a sample of collodio-chloride by Mr. Swan's formula, but found it unfit for paper; by adding two grains chloride of calcium, and three grains of citric acid with one drop castor oil to each ounce, we obtained a good print in 15 minutes by diffused light; with albumen paper the print required 35 minutes under the same conditions of exposure. We enclose the prints as also one on plain paper prepared by our presented formula The addition of castor oil to the collodion prevents the excessive bronzing that citric acid causes, and we may add enable pictures to be produced by the same mixture on either opal glass or paper.

[The prints enclosed by our contributor are excellent: that on plain paper one of the most perfect in that style we have ever seen.—Ed.]

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ABOUT LIGHTING THE SITTER, AND SOFT PICTURES.

BY J. C. LEAKE, JUN.*

I confess entering upon my task this evening with some trepidation, after the able and almost exhaustive paper read by Mr. Jabez Hughes at your last meeting. But an earnest desire for improvement in these particulars *of lighting and softness*, both in my own pictures and in those of others, leads me to overcome any hesitation I have in occupying your time this evening. I think it is well when a subject is once started, to try and carry it out to a practical end before giving up, and certainly we ought to have had a better discussion upon Mr. Hughes' paper, than we had upon the last occasion.

That the subject is one of extreme importance no photographer will be rash enough to deny. The public are beginning to look for something more than that mask of white paper with several black holes in it, which a few years since did duty as a photographic likeness. They now require that their eyes, nose, head, hands, &c., should not be misrepresented as "independent members," separated the one from the other by patches of white paper, or by "empty voids" of black shadow; but that they should be connected by half-tone, and that the same ugly patch of white paper shall not be held to properly represent forehead, shirt front, glittering watch chain, and shiny boots. Mr. Hughes asks, "Who will get up an agitation against white paper faces and black shadows?" My reply is—the public are already doing so; therefore, the best thing we photographers can do is to set to work and remedy the defect as quickly as possible; and this is my excuse for engaging your attention to-night.

To properly light the model is undoubtedly the most difficult portion of the photographer's duty; and it is almost as difficult to *describe*. In fact, we cannot describe it. The constantly varying conditions, both of the light itself and of the models to be photographed, would forbid it, even if individuality of taste in the artist did not. But this must not be worked up into an excuse for letting our ideas run wild on this subject, and I shall endeavour to show that although we cannot teach anyone how to light each individual sitter, we can yet lay down certain rules, and adopt certain fixed principles which may render good lighting more easy of attainment than it is at present. I shall, therefore, attempt to *roughly* describe the effect produced by light falling upon the sitter in certain directions, of course, leaving the principles to be applied by photographers themselves.

As all operating rooms, or nearly all, have glass roofs, we will begin if you please with top-light. (By top-light I mean all light falling upon the model at a more acute angle than about eighty degrees.) Top light may be said to be most unsuited for portraiture, making prominent in the face all the most unlovely features. It sends the eyes back into deep shadows, and brings the cheek bones forward, gives a white patch upon the top of the head, and separates the head from the body by a deep, black gulf of shadow, brings out all wrinkles and markings in undue proportion, and is, in fact, altogether given over to evil ways.

I am inclined to believe that few good pictures have been, or can be, produced by top light. Of course we have many *rooms* lighted from the top alone, but where good pictures are produced in these, it is because the artist has boldly "*taken old Sol by the beams*," and made him do his bidding, by turning his rays upon the model in some other than a vertical direction. I think we may therefore say that rule the first, for lighting the sitter, should be, *use as little top, or vertical light, as possible.* A small quantity of light may be admitted from the top of the room, in front, and on one side of the sitter with advantage. It should not be too strong, but allowed to just strike upon the more prominent portions of the face. This will give sharpness and piquancy to the lights, particularly that sharp line down the nose, so necessary to give proper relief to the features. We now come to consider the effect of front light. By this I mean light admitted directly in front, and on a level with the sitter. The tendency of light falling upon the model in this direction is to produce flatness, and that peculiar and unpleasant effect called "adherence." All the parts of the picture appear at the same distance from the spectator, and the sitter seems as if let into the background. Some small quantity of light of this sort may at times be useful in overcoming an excess of light in other directions, but it should always be borne in mind that its tendency is to flatten the picture and destroy brilliance. I think we may therefore consider it as our second rule, never to have a window directly in front of the sitter, and to admit no more light in this direction than is absolutely necessary.

But the light upon which the photographer must mostly depend, is that admitted from the side. By side light I understand all that light falling sideways upon the model, which may be included in an angle of 60° or 70°, both vertically and horizontally.

In most cases this will be the principal source of light. Of course this will illuminate all the projecting portions of the model, and produce a great effect of relief. Perhaps to admit the principal light at an angle of about 40° or 50° will be best as a general rule, but of course this must be varied to suit the peculiarities of the sitter. For very prominent features it may be used well in front, which for more delicate faces the admission of light well from the side will give a pleasing amount of relief and roundness. A small quantity of light admitted between the sitter and the background is very useful in detaching the different portions of the picture, and giving proper relief to all its parts; it will also help to remove that dark shade upon the top of the background so frequently seen, and which gives such a heavy and unpleasing appearance to what would otherwise be excellent pictures. I should recommend that the studio be constructed to admit side light from floor to roof, and so as to include a long angle from the background. Rule three we may, I think, lay down as follows. The principal light should mostly be on one side, and slightly in advance and above the head of the model.

I think those I have mentioned may be considered the principal directions in which the light can be made available for portraiture; but as with these alone the transitions from light to shadow would be too abrupt or sudden, we must use reflected or diffused light to soften, and lead as it were, the light over to the shadow, so as to produce a proper and harmonious whole.

We have two modes open to us for accomplishing this; first, we may admit such a portion of *direct* light as shall properly balance and relieve the shadows cast by the principal light; or we may so arrange certain screens or reflectors as that they may receive, and reflect back as much of the principal light as may be required to produce the desired effect.

Although the second method named may be best under most circumstances, no studio can be considered complete unless either method *can be used* at will. It will sometimes happen that we cannot get reflection enough to properly equalise the lighting, and it must be remembered that as we shut off the direct light, we diminish the quantity reflected; when we have nothing left but to admit as much diffused light as may be required, the which, if we have glass only on one side, as some recommend, we shall be sorely puzzled to do. On the other hand, if we have only diffused and no reflected light, it will often be found difficult, if not impossible, to keep it in proper subjection; and we shall find produced the absurd effect of shadows projected in different directions in the same picture.

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* Read at the South London Photographic Society, May 11, 1865.

It has been objected to the use of screens that they frequently reflect the light back into the eyes of the sitter, so as to produce the effect of blindness. This need not be the case if care be taken, and the following rules observed:—Avoid the use of any polished surface, such as silvered glass or tin foil; keep the reflector upright, and not inclined toward the sitter, and do not let the sun shine on it when in use. Ordinary white-satin wall paper is a very excellent material for covering a reflecting screen.

In concluding my remarks on this part of the subject, allow me to say I think with Mr. Simpson, that the photographer should have as much glass as possible in his studio, and with Mr. Hughes, that he should make *use* of as little as he can do with; what he does want, however, he should be able to turn upon the model in any direction he may require, which, in a room constructed as Mr. Hughes recommends, would be impossible.

We now come to consider for a short time, for this paper has already become much longer than I intended, the question of softness, or, and I like the term better, gradation of tone in the picture.

Mr. Hughes introduces a very civil old gentleman, (almost "to good to be true," by the way) who argues with great force and point, against the deep black shadows, which he finds produced in his photographs. He seems to think that the light used by photographers is too strong; and that the somewhat abnormal conditions in which a person is placed, while sitting for a portrait, are such, that a pleasing likeness cannot be produced. No doubt this is true to some extent. We must plead guilty to a fancy for plenty of light, and for putting the sitter "out of his misery" as quickly as possible. But I have yet to learn that proper gradation cannot be secured even in the brightest light. In the early days of the art—when bromide was not, such an idea might do, but now, no matter how harsh the lighting, we ought to be able to produce a fair amount of gradation. Do not let me be misunderstood, I do not advise harsh or careless lighting; I have before said it is of the utmost importance to light the model well, but we must not altogether ignore the fact, that we have provided for us a means of avoiding harsh contrasts and "hardness," in a proper modification of our chemicals. We find two men, both producing good, soft, pictures—one can only use Mr. A's collodion, the other, Mr. B's, and each one condemning the collodion used by the other; the reason being simply this—that in one gentleman's room the lighting is naturally soft, and, Mr. A's collodion giving a good strong, intense image, is precisely the thing required, while the other equally good photographer, having a room with a great deal of top light, say, and one which gives sharp contrasts of light and shade, swears by Mr B's collodion, which gives great detail with but little intensity. I believe in using all the means we have in order to attain our ends, and assuredly we ought not to ignore our power in this direction.

But ought all our pictures to be so soft and delicate? Suppose, for instance, our model is an old gentleman who has seen service in India, with sunken eyes, deep-furrowed cheeks, and strongly marked features altogether. Now, if we produce a delicate, light, picture, will it be truthful? I think not; beautful? certainly not; the beauty of such a head will be in the impression it conveys of strength of character and power of will. Men who have nearly done a life's work, hard work, don't look delicate. I say, therefore, let such a face be lighted to look what it is, a portrait of a man, and not like that of a girl of sixteen. "But the public don't like that," says my kind photographers. Well, I know they don't, and I am sorry for the public, but they will some day, and that before long. But while I would so light the sitter spoken of as to give as much boldness as possible, I must not be understood to sanction hardness or want of gradation, for it must be remembered that we may produce the boldest relief, and finest contrasts of light and shade, and yet secure perfect gradation. I am inclined to think that of all the causes of hardness, under-exposure is the most frequent and inexcusable. Since the theory that some of the shadows should be represented by bare glass was started, under-exposure has been rife, and so long as the bare glass was there, the half tint in the face might be sacrificed. We have made a mistake I venture to think, when we can secure perfect gradation and bare glass too, by all means let us have it; but if not, we will have the gradation on one plate and the bare glass on another, always remembering that the same bare glass represents black without any gradation whatever, and that it is consequently to be used most sparingly.

One word, in conclusion, as to the influence of tone in the positive. Most of our portraits are too cold in colour to properly represent the half-tints of flesh. Once, showing some portraits to an artist friend of mine, he said, "they look as if you ought to buy them at an ironmongers." How many of our portraits look cold and unpleasing, which would, if properly toned to a warm colour, be of the most pleasing character. We frequently hear people complain that their faces look black and dirty, and so they do, as if they had been blackleaded before sitting; but just keep the tone warm, and what was before dirt is now half-tint, and the effect is pleasing. The chief charm of the exquisite vignettes of Mr. T. R. Williams is that lovely, warm, easy, tone. Take an ordinary print, and place it side by side with one of these, and you will be surprised to find how much warmth there is in it. You will never find a flesh shadow black (except, perhaps, in the irrepressible nigger), therefore you cannot expect to represent it by black. While on this subject, may I ask why so many artists work in so dark a key? would it not be better to keep our pictures lighter, and so make them more cheerful?

I often think that much of the delicacy and beauty of our best portraits are lost by over-printing. Unfortunately, photographic printers seem to work more for the shadows than the lights. I know that white paper does not represent flesh, but neither does black or brown; and I think those very small points of high light on the forehead, and down the nose, may, if the negative be a good one, and full of gradation, be left white or as nearly so as may be. Our paper has mostly a slight tinge of colour, quite sufficient to prevent any harshness, if used in moderation. We have but a limited scale of tones in which to work, and my impression is, that with a good negative, all we have to do is to look after the lights, and leave the darks to take care of themselves. If we place it against the high lights, on the face of a well-lighted model, we shall be surprised to find how light they really are, while against even a dark cloud white paper is comparatively black. These and other considerations, therefore, lead me to the conclusion that our portraits would be frequently much more pleasing, if printed altogether lighter.

I hope, gentlemen, you will excuse the absence of novelty in these gossiping remarks, and the dwelling so long upon such seeming trifles, remembering that these trifles go to make up that perfection which is certainly no trifle.

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ARTIFICIAL LIGHT FOR ENLARGEMENT.

BY ALFRED HARMAN.*

The growing popularity of life-size photographs, and the difficulties attending their production in this country without the aid of artificial light, are facts tolerably well known amongst photographers; I, therefore, venture to think that a brief paper on the subject may not be unwelcome. During the past long winter I have, like many others, been engaged in experiments in this direction; and, as the results seem to me deserving attention, I shall proceed to place them before you.

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* Read at a Meeting of the South London Photographic Society, May 11, 1865.

I commenced with the oxyhydrogen light, and soon found that making oxygen was not such child's play as some of the vendors of apparatus assert it to be. I first used for the purpose one of Jones's retorts made of cast iron, with a top to it fitting on something like the cap of a collodion bottle. This top is intended to prevent the possibility of an explosion; but, strange to say, the retort itself seems to be made with the view of bringing about the very accident which its top is intended to prevent. First of all, it is so thick that it is a very long time getting sufficiently hot to make the gas pass over. Frequently one has to wait a quarter of an hour at once (I speak of its prudent use with a small gas stove), and, when it does begin, there is no controlling it, owing to the great amount of heat the retort itself retains. When using it I turned the gas flame very nearly out immediately the oxygen commenced to pass over, there being always sufficient heat retained by the retort for its completion. The gas is generated with such rapidity in this retort, through the mass of cast iron of which it is made, that it quite shakes the room; and very often the pipes are not large enough to convey it to the bags sufficiently quick, in which case off goes the top, dragging the bottles with it, and wasting all the oxygen. I have now given up the use of this retort, and have adopted one made of sheet iron, which I like much better, as it is free from most of the defects complained of in that of Mr. Jones's, but there is no satisfaction in anything without a vent. There is also another defect in retorts as usually made for sale, which is, that the pipes are too small. If any of the manganese and chlorate mixture gets into them (as it is very liable to do) the chances are that there will be a stoppage, and, not unlikely, an explosion.

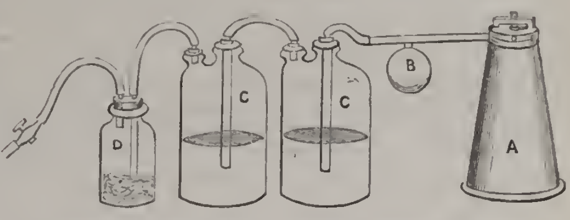
I have now to submit to you an apparatus of my own, which is free from the defects here enumerated. It consists of a retort made of sheet iron, shaped something like a coffee pot, which shape I consider best, as the mixture from which the gas is made is less liable to be forced into the pipes. At the top there is a safety valve, so that, if there be a stoppage in the pipes from any cause whatever, it will open and allow the oxygen to escape, without the inconvenience attending the ground top in Jones's retort before mentioned. There is, however, from the arrangement of the apparatus, but little likelihood of the valve ever coming into operation; but, I think, you will agree with me that it is as well to be provided against any emergency.

As you will see by glancing at the apparatus before you, there are two bottles for washing. I have found the second necessary, inasmuch as the water in it is always more or less impregnated after use with the manganese, which otherwise would pass into the bag. I have also found it needful to dry the gas over chloride of calcium, for which purpose there is a bottle provided with the apparatus. When the gas comes over quickly the calcium is sometimes quite wet, which shows the necessity for using it. The pipe leading from the retort, for reasons previously mentioned, is about twice the size of that usually employed; but I do not consider it necessary to employ the large pipe after the first washing bottle, as the gas is then comparatively pure, the cause of stoppage in the pipes being manganese carried up by the gas into them, the principal part of which is left in the first washing water. There is a ball fitted between the retort and first bottle, which is to catch any water that would otherwise pass into the retort, in cases when it becomes necessary to lower the temperature in consequence of the gas being generated too fast. The apparatus before you was made for me by Mr. How, of Foster Lane.

I find the common carburretted hydrogen, as supplied by the gas companies, quite good enough for all practical purposes. Although the light from the pure hydrogen may be a little whiter, I do not think this would compensate for the increased trouble of making it.

The burner I use is one that allows the two gases to mix just before ignition. There is also a convenience for raising or lowering it, which is very handy, as it is almost impossible to adjust it to the right height by measurement.

The subjoined sketch is a representation of the lantern I use. It is fixed on a table at a convenient height from the floor, and has a door on one side with a piece of yellow glass let into it, in order that you may look through when arranging the light. There is a chimney at the top similar to that on a magic lantern, to allow the heated air to escape. The taps are worked from under the table.



A, the retort. B, hollow ball. C C, washing bottles. D, bottle containing chloride of calcium.

The exposure, of course, varies according to the amount of amplification required, and the density of the negative. I find it range between two minutes and half-an-hour with one hundredweight on each bag. If a greater weight was employed it would, consequently, be shorter, but I think one hundred-weight is as much as a bag can be expected to stand with safety. I am alluding to enlarging direct on paper.

While on the subject of exposure, it may be as well to mention that Mr. Taylor informs me that, by simply introducing a deep meniscus lens between the light and the condenser, at least fifty per cent. of light is gained. I have not yet had an opportunity of trying this, but it appears to offer immense advantage.

I gave the magnesium light a trial, and found it to answer very well so far as the results were concerned, but the cost at present is too great to permit its being used for professional purposes. Still, there is something pleasant in using it, as it is always ready to your hand without any preparation.

It must not forget to say, for the information of those who feel disposed to use magnesium for enlarging, that they must provide a chimney at the top of the lantern to take off the dense fumes that would otherwise fill it and totally destroy the brilliancy of the light. I find the light from magnesium ribbon about six times more actinic than the lime light.

If what I have now placed before you tends to make the use of the oxyhydrogen light less dangerous, and facilitate the operation of enlarging by its means, my object will have been accomplished. The uncertainty, difficulty, and few opportunities we meet with in enlarging by solar light render the successful application of artificial light a matter of considerable importance. It not only renders us independent of that sun, whose English visits—angel like—are few and far between, but it more than doubles the number of hours during which we can work at enlarging, produces results equal, if not superior, to those by sunlight, simplifies the manipulation during the process of printing, and retains in this country work which would otherwise find its way into the hands of foreign operators, to the detriment of a new and very attractive branch of photographic art.

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PHOTOGRAPHY IN DENTISTRY.*

Dr. J. H. McQuillen, Professor of Anatomy, Physiology, and Hygiene, in the Philadelphia Dental College, has favoured us with a copy of his address on "The Anatomy and Physiology of Expression." From his preface we quote the following :—

"As the most careful observers and the best judges of what constitutes a natural expression, can only form an approximate estimate of the expression of those whom they are called on to serve after the loss of natural teeth, it is reasonable to infer that valuable assistance would be found by bringing in the aid of photography to determine nice or doubtful points under such circumstances. Indeed, as the memory of man is so treacherous, it would be of assistance even in cases where the face is long and well known to the operator. At a period when photographs are so much in vogue that they are used as *cartes de visite*, and when it is the exception where persons have not sat for their picture, the dentist will have little or no difficulty in securing full-face, quarter-face, and profile views of patients taken long before the loss of the teeth. With these in hand, the skilful and artistic practitioner will be able to preserve or restore, or if need be improve, the old and familiar expressions."

The Doctor is a warm friend to the art of photography, and recently exhibited to us some photographs of a soldier whose lower and upper jaw had been mostly shot away by a shell, together with most of the right cheek ; the wound had been allowed to heal in the hospital, and the poor man had lost the entire use of his tongue. The case coming to Dr. McQuillen's notice, his first act was to have the man photographed, showing the effects of the wounds most prominently, and his next to endeavour to make a new lip for the poor man, and try to restore the use of his tongue. In the second photograph taken of the patient we notice great improvement, and at the sitting he was able to make sounds. Shortly we hope to see the humane and indefatigable D.D.S. with a photograph of his patient with a new set of teeth, and quite able to talk, taste, and masticate. Oh ! Photography, where will thy uses and applications end ?

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PLAN FOR FUMING.

BY L. E. GIBBS.†

Mine is a box 22 inches long, 14½ inches high, and 10 inches wide, outside to outside ; boards five-eighths of an inch thick ; with two doors meeting in the centre, with a lap to keep them tight.

There is a board two inches narrower than the box, and fastened one inch from front and one from rear of the box, to let the fumes pass freely to the paper ; the board is located ten inches from the upper board of the box, and on this board and the upper board of the box are nailed strips of board to produce grooves half an inch in width, that are three inches, outside to outside, apart. In these grooves the boards slide which hold the paper to be fumed. The boards are a half-inch thick, rounded off, on both sides, to a quarter-inch at each edge, forming a circle leaving it half an inch thick at each edge ; the reason for this is, to have the elastic, which is placed at each end encircling it, hug tighter than it would if the board was level. The paper is simply tucked under the elastic at both ends and on both sides ; thus it will hold the paper, spread out flat, to be evenly fumed.

The ammonia is placed under the inside board in a plate or cup : this board should have a number of holes to permit the fumes to ascend readily.

Proceedings of Societies.

South London Photographic Society.

The usual monthly meeting was held in the City of London College, on the evening of Thursday, May 11th, Mr. Sebastian Davis in the chair.

The minutes of a preceding meeting having been read, the Rev. J. Galloway Corran, and Mr. Stuart, of Elgin, were elected members of the Society.

The Chairman called attention to the prints of the society, now remounted by Mr. Fox, to whom the especial thanks of the society were due for doing this without charge.

Mr. J. C. Leake then read a paper on lighting the sitter, and soft pictures, in continuation of the subject treated by Mr. Hughes, at the last meeting (see p. 233).

Mr. Noel E. Fitch, in response to the chairman, said he could add nothing to what Mr. Leake had said ; he so thoroughly agreed with him. He thought it was one of the best papers on the subject to which he had ever listened.

After further invitation to discussion from the chairman,

Mr. Wharton Simpson said it seemed a poor compliment to such a paper as that to which they had just listened to, allow it to pass by in silence ; but the fact was, it seemed to leave nothing to discuss ; the results of good lighting had been so admirably and appreciatively described, and the practical hints were so thoroughly to the purpose, that nothing could be gainsaid. He had the pleasure of agreeing with and endorsing almost every word Mr. Leake had said.

Mr. H. P. Robinson agreed with Mr. Leake exactly in his views on the subject of lighting, both as regards the results to be produced, and the method of producing them. He especially endorsed his remarks on the value of full exposures.

Mr. Howard said that we generally looked at the faces of our friends when they were illuminated with a side-front light at an angle of 50° or 60°, and this light would generally give the most natural and pleasing-looking portraits. Unusual and striking effects of light were sometimes interesting in studies, but rarely so in portraiture.

After some further conversation,

Mr. Simpson showed a portrait on opal glass from a negative by the late Mr. Lacy, which he thought a very fine example of lighting for a bold head.

Mr. Blanchard said that although a high state of uniform excellence had been attained in photographic portraiture, there were still some specimens which stood out from the rest with such a distinctive excellence, such as those of Mr. Williams, Mr. Robinson, and many of Mr. Leake, that they could be recognized at once as altogether original, and this distinction was due to the lighting. It was, he thought, especially due to that lighting which Mr. Leake had described, in which there was a good amount of diffused light present, but one bright pencil of direct light to give brilliancy and force. The subject of lighting was still little understood by the mass of photographers. There was plenty of common-place excellence, but a great lack of the highest excellence. There was a great want of that perfection and variety of gradation called, by painters, tone.

Mr. Leake, in responding to a vote of thanks, said his aim had not been to make a parcel of vague remarks about lighting ; but, if possible, to give some definite practical hints on the effects of light falling in certain directions. He should be glad if others would do something definite and practical in the same direction.

Mr. Blanchard said he considered any studio imperfect which did not admit of facilities for using the light from any direction. A light from the north only decreased difficulties, but tended to produce mediocrity.

Mr. Alfred Harman then read a paper on the production of artificial light for enlargements. (See p. 234.) The paper was illustrated by a complete set of apparatus for the manufacture of oxygen, made by Mr. How for the purpose. In answer to some questions, Mr. Harman stated that he had not attempted direct printing by artificial light ; because requiring, as this did, a hundred times as long exposure as direct sunlight, the time would be so enormous. The shortest exposures for direct printing by sunlight were not, he believed, less than half an hour, which would make fifty hours for the same operation by the oxyhydrogen light.

Mr. Howard asked if Mr. Harman had tried some extra-sensitive medium like the collodio-chloride,

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* From *The Philadelphia Photographer.*

† From the *American Journal of Photography.*

Mr. Harman had not done so at present. He hoped by and by to do so and would report results.

A desultory conversation on various points of manipulation in the manufacture of oxygen followed, in which Mr. How, Mr. Harman, Mr. Fitch, Mr. Werge, the Chairman, and others took part. Various suggestions for testing the purity of manganese, and preventing accidents were made, Mr. Harman stating that he always used his manganese over and over again, so that when he had once got it good, he had no further trouble.

Mr. How thought it always desirable to heat the manganese to a red heat before using it.

Mr. Harman, in answer to a question, said he had not used artificial light for enlarging negatives, as even in dull weather there was generally daylight enough for that.

After some further conversation, and a vote of thanks the subject was dropped.

As the next meeting will be the annual meeting, notice was given of a motion for reconsidering some of the rules.

The proceedings then terminated.

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, 17*th May*, 1865.

Our Photographic Society has awarded its annual medals to the following promoters of the art. To Sir David Brewster, for his invention of the semi lenticular stereoscope, which has given so great an extension and development to photography. To M. Civiale, for his application of photography to the representation of mountains. To MM. Dufournet and Co., for their invention of dishes of cardboard; and to M. Laussedat, for the application of photography to surveying. It will be understood that these medals are not the awards of competitive superiority, but bestowed by a committee whose duty it is to single out those individuals who, by their inventions or improvements in any department of photography, have materially advanced the art. It will be seen that the awards have a retrospective character, a course that must obviously be necessary; for if they were confined to the discoveries and improvements of the preceding year, they might sometimes be bestowed on individuals whose claims would be insignificant, compared with those of their predecessors. It might happen, some years, that useful discoveries abounded, affording ample scope in making a prize distribution: but upon reviewing the discoveries of the past five and twenty years, which have permanently enriched photography, the difficulty of finding four annual claimaints for medal distinction will at once be evident. It is not every year that yields a perfect tannin process, a satisfactory carbon printing process, an alkaline gold toning process, or a chloride in collodion process. But that four such contributions to the art should be contributed during any one year is more than the most sanguine will venture to look for.

Photography has again appeared in our law courts, and the carbon printing process is the bone of contention. M. Charavet, the assignee of M. Fargier's patent, demanded that M. Poitevin's patents be set aside on the plea that they were not his original inventions. M. Poitevin, on the other hand, demanded that M. Fargier's patent be set aside on the ground of piracy, and claimed damages for the infringement of his patent. M. Poitevin gained his cause, but the court awarded no costs. The cause was then carried, by appeal, to the *Cour Imperiale*, and the following is the decision:—

"In what concerns the validity of the patent granted to Poitevin on the 27th August, 1855, that although the property of the alkaline bichromates mixed with gelatine or any other analogous substance, of becoming insoluble under the influence of light, had been turned to account previously, Poitevin is the first who employed it for taking direct photographic proofs on paper; that Talbot and Pretsch only employed it — the one for the production of engraved metallic plates, the other for obtaining relievos to be covered with a metallic deposit, by the aid of the electrotype process.

"Considering that the colouring of photographic proofs upon paper, by any other means than the action of light, was new—that if Lafon de Camarsac was the first to treat such proofs with coloured powders, his process, being specially adapted to the production of enamels, could not be applied, on account of the materials employed, to the printing of proofs upon paper.

"Considering that, under the twofold relation of process and product, the invention of M. Poitevin was patentable:

"Considering that the patent might have lapsed from non-use, we find that M. Poitevin or his agents have practised the invention, and, in consequence thereof, obtained notice in 1855, 1856 and 1858, at the exhibitions of Paris and Brussels, and at the exhibition of the Paris Photographic Society: moreover, licences have been granted by Lemercier, the present assignee of the patent:—

"Moreover, adopting the conclusions of the first court:

"Considering that by the additional testimony of Poitevin, it is established that since the judgment appealed against, Charavet has continued his advertisements suppressed by the said judgment: that the prejudice having been continued, there is reason for increasing the damages awarded, and that this court has the materials necessary for appreciating their importance."

In what relates to the suit brought by Poitevin against Fargier:—

"Considering that in the first court Poitevin demanded the annulling of Fargier's patent: and that this principal point having been conceded, it was not right to condemn Poitevin to pay the costs:—

"Considering, upon the additional evidence of Poitevin as to the damage to his interests, that Fargier has not sanctioned the publicity by Charavet, continued since the verdict, and.—

"Adopting, moreover, the conclusions of the first court, but reversing the sentence appealed against, inasmuch as it condemned Poitevin to pay Fargier's costs, we amend it by discharging Poitevin from this penalty, and compelling Charavet to pay to Poitevin the sum of 500 francs damages, or suffer one year imprisonment: Poitevin to have no claim for damages against Fargier; by ordering the costs awarded on the appeal of Poitevin to be repaid: condemning Charavet to the costs of his appeal, and of the costs incurred by Poitevin and Fargier: condemning Fargier to the costs of the first trial, and of Poitevin's appeal, and condemning Charavet to indemnify Fargier for the expenses he has incurred in the suit with Poitevin.

At the last meeting of our Photographic Society, Mr. Claudet described his improved method of Photosculpture, to which he gives the name of *Plastimonography*. In this new process, the pantograph is dispensed with. By means of a magic lantern, the negatives are successively projected upon the mass of clay itself of the exact dimensions it is desired to give to the sculptured model: but as the picture can be exact only on a vertical plane, it is upon this vertical plane that the tool must attack the picture, and follow the lines that must be transferred to the block. Imagine an instrument formed of a light rod of steel, pointed at one end, and carrying a white disc at the other extremity in the form of a mushroom: if, holding it in the hand, we pass the disc over the plane of the picture, and keep the rod always perpendicular to this plane, every part of the picture will come in succession, during this movement, to be represented upon this disc. We may conceive that, if in the middle of this disc a fixed point is found, black or shining, we can follow with this point all the outlines and markings of the image which is represented on the disc, and that during this movement, the point of the tool, the axis of which coincides with the point in the middle of the disc, will trace the same outlines upon the block of clay.

A detailed description of this process will, doubtless, soon be published: but from what has been stated, it will be seen to possess much ingenuity. It offers great facility and accuracy in working, while the results are marvellously fine. It is at once apparent that it will be impossible to obtain a method more exact and simple for producing sculpture by the aid of photography.

DR. VOGEL'S DISCOVERY AND THE ALKALINE GELATINE PROCESS.

Dear Sir,—Dr. Vogel apparently shows plainly the *modus operandi* of the action of light on iodide of silver films, it seems one of those simple truths which are lost or rather overlooked, in seeking out for abstruse and complicated theories; now the reaction is accounted for, we open our eyes and rub them, so to speak, feeling like a schoolboy when he has mastered his first sum by the help of his neighbour.

Just as Dr. Vogel says, the action of the light is accelerated by addition of carbonate of soda to tartarized antimony, so is it to the gelatine solution in the alkaline gelatine process; for, as is well known, if we apply a plain solution of gelatine as a preservative to the film, the exposure is six times as long as the ordinary wet plate requires; whereas, make that gelatine solution alkaline with carbonate of soda, and forthwith the exposure necessary is vastly reduced, so much so, that it is nearly or quite as sensitive as the wet plate, and, keeping the same principle in view, the gelatine formula may be varied *ad libitum*, although, of course, many things that will serve to illustrate a principle, will not answer in practice; for instance, a preservative coating of soap gives a very sensitive surface, honey and soda, or potash, albumen, and an alkali, organic matter of a hundred varieties may be used, and all the soluble alkalies that unite with iodine, lime water, solution of magnesia, &c. I can only feel surprised that this fact has not been more applied in practice.—I am, dear sir, yours, &c.,

Wm. Bartholomew.

ON A TRIPLE CEMENTED COMPOUND, CONSTRUCTED ON THE PRINCIPLE OF THE APLANATIC (DOUBLE) VIEW LENS.

Sir,—Having read, not without interest, a paper lately communicated on a new triple lens by Mr. Dallmeyer, as published in the Photographic News and other journals, it will perhaps be not uninteresting to add shortly my own researches and experience in respect of such a lens.

Some years since (the exact number is immaterial, but probably about seven) I made a rough theoretical investigation of such a triple lens, on the principle of the "aplanatic." The result was decidedly unfavourable as compared with the more simple double combination (aplanatic), in consequence, a practical trial by actual construction was not proceeded with, and subsequently, on the same construction being suggested by a correspondent as a possible improvement, I replied by stating the unfavourable conclusions to which I had already come in respect of same.

Still later, and for a reason quite independent of any expected excellence in the lens, and which it is unnecessary here to mention, I *did* put the triple construction to the test of actual trial. The time of so doing, together with that which is likely to be of more interest to photographers, will sufficiently appear from the following extracts from a letter written to Mr. Shadbolt, on October 16, 1862:—

"You may recollect your suggesting some time since that a triple lens on the principle of the aplanatic, but having the crown power divided between two lenses, might be an improvement, while I had already considered the matter, and was of the opinion (from theoretical views) that it would not."

The letter then proceeds to give some reasons for having recently constructed such a lens, and continues as follows:—

"These considerations have led me to try the thing by constructing a triple cemented compound, in which the second crown lens was assumed at one-third the power of the first. The result is, that the distortion appears to be greater (as compared with the aplanatic), and the lateral pencils decidedly worse."

Such being my estimation of the construction, it cannot be wondered that I did not publish it, and Mr. Dallmeyer is, of course, entitled to any merit due to its publication. The point interesting to photographers, however, is, whether it is any improvement on the more simple and, of course, less expensive, "aplanatic" double lens, and here I would observe that I have failed to observe any *reason* given in Mr. Dallmeyer's paper for the triple being a superior lens—I think we have yet to learn *why* it should be capable of covering a larger angle, or give less distortion, or bear a larger aperture of stop. Why its central pencils should be better corrected for aberration, or its lateral ones for astigmation. A slight consideration must, I apprehend, show that the more simple lens is better corrected for spherical aberration, an advantage not to be lightly set aside without some redeeming quality as a makeweight, which last, I apprehend, the triple lens does not possess.

With respect to the large angle which the lens is stated to cover, it may be recollected that the simple expedient of advancing the stop nearer to the lens will produce that effect in all view lenses, to the injury, however, of all but the central pencils.

It will be observed that the *proportion* for the powers of the two crown lenses, assumed by Mr. Dallmeyer, is identical with that used by me in 1862. I allude to this coincidence, not as supposing that Mr. Dallmeyer had any knowledge of my triple lens, but as leaving the less room for any essential difference in the way of advantage of either triple lens over the other. The lens which I had constructed in 1862 is still in my possession; it is three inches in diameter and about twelve inches in focus. Thomas Grubb, F.R.S.

Dublin, May 13, 1865.

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Photographic Notes and Queries.

A Method of Keeping Collodion Negatives, after Development, till convenient to Intensify—Principally useful in Outdoor Photography.

Sir,—Having never deserted the wet-collodion process, for outdoor photography, for any of the dry ones now so popular, believing that better results fully compensate for the extra trouble incurred in using the dark tent, I have rather thought the labour in the wet process could be much reduced by dispensing with the intensifying, fixing, and washing, leaving this to be done at leisure in the dark room at home, where plenty of clean water can be obtained. This idea is not a new one, as glycerine and other substances have been used, but none of them can equal in simplicity and certainty the method I have now employed for some time, and which I have thoroughly tested in practice.

I have constructed a small tin box, for holding my negatives similar to the ordinary plate box, with the plate grooves shaped thus, VVVV, to keep the collodion film from being striped, and placed pretty near each other, which makes the box less bulky and lighter to carry, the body of the box is made a little higher than the longest way of the plates, to which is attached a tight-fitting top, the whole of the inside of the box is lacquered to prevent rust, and has a small handle attached to the top for carrying. When I go out to take views, I fill it with distilled water, and carry it in my hand, generally having some conveyance for my tent.

Common water would do, but distilled is preferable. My tent being pitched, I place this box in a convenient corner of it, and as the plates are developed and washed, they are gently slipped down the grooves into the water. When the whole are taken, I shut the top of the box to exclude the light, they can now be carried home, and intensified at leisure, if not convenient to do so the same day, may be left till morning, when they will be found to be in as good condition for intensifying as when newly developed.

The size of the above box I use is made for holding plates 8½ × 6½ on this views can be taken the full size of the plate; or with a division in the camera, a couple can be taken for the stereoscope or mounted carte de visite size. A gutta-percha vessel, constructed similar to the above would, no doubt, be preferable, as it could be made water-tight, allowing it to be packed along with the rest of the articles. The advantages in using this method of keeping the developed plates are numerous, double the number of negatives can be secured, and advantage taken of a favourable light, as much valuable time is lost in the ordinary way of finishing the process in the field. Little water is required, one-sixth of the quantity generally used is sufficient, few bottles are necessary, collodion and developer is all I require, my bath is water-tight, and contains the nitrate solution, so that my pack does not contain many articles. If you think this letter worth inserting in your valuable paper, I will fell obliged. Yours truly,

Peterhead. JAMES SHWAS.

P.S.—This letter was written more than a month ago, but I delayed forwarding it to your paper till I saw a correspondent in your last week's impression suggesting the keeping the plates in a water bath. I can say I have tested it in practice, and can recommend it to your readers; should they be inclined to give it a trial, I am sure they will be satisfied with the results.

MUDD *v.* MESSE.

SIR,—I am aware that there is scarcely any limit to the number of applications that may be made of a new idea; still, I was hardly prepared, when experimenting on a new method of taking photographs without the use of the nitrate bath, to have my plan appropriated and applied to so very different a subject as the composition of lectures. But I console myself with the reflection that the plagiarism which I conceive has been committed is not likely to prove very successful. It may be a good process for taking photographs to mix up nitrate of silver and collodion in a bottle, though I fear the process would be somewhat interfered with by the addition, suggested by your visionary contributor, of a bit of wash leather and a bottle of developer. But I cannot imagine that the *best* to write a satirical paper is to shake up in our ink bottle the Crystal Palace and a revolving camera, an angle of aperture, and a quotation from Shakespere—"Sparkling wit and profound philosophy," with half a hundred other things, and then to pour the muddy mixture as evenly as possible over 5 by 4 sheets of foolscap. I am, sir, yours obediently, N. O. MESSE.

[We fear that our friend Mr. "N. O. Messe" scarcely does himself justice in regarding the allusions in Mr. Mudd's paper to Mr. "A. Messe," as referring to himself. We might, with equal propriety, fancy that our collodio-chloride process was satirized. But we know too well the real kindliness and gentlemanly feeling of Mr. Mudd to believe that any individual reference was intended, or that his remarks were intended to convey anything beyond a playful satire on an undue regard to processes instead of their intelligent use in obtaining good results.—ED.]

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Talk in the Studio.

PHOTOGRAPHY IN THE DUBLIN EXHIBITION.—We are glad to announce that the photographic department in the Dublin International Exhibition is a decided success, and has met with general admiration and approval. We believe, thanks to the able energy of Sir Jocelyn Coghill, and his unvarying courteous consideration of all claims, a greater amount of general satisfaction has been secured than often attends such exhibitions. The foreign department is not quite complete yet; and the works of a few able English photographers, whose names appear in the catalogue, have not yet come to hand. The general press has not given much attention to the photographs yet, but we find in one of the morning papers some very fair remarks on the works in one room only. Amongst these we find Mr. Rejlander receives high commendation, as does also Mr. Cooper, jun., and the Wothlytype Association. The specimens of Messrs. Mawson and Swan, by our collodio-chloride of silver process, on opal glass, receive high praise. Mr. Robinson's large compositions, we understand, attract much attention and admiration. Amongst landscape amateurs, Sir Jocelyn Coghill and Mr. Brownrigg are mentioned as excelling. We hope shortly to give a detailed notice.

THE PRESS AND PHOTOGRAPHY.—The press generally has given but little attention as yet to the photographic exhibition open in Conduit Street. The *Illustrated London News*, speaking in favourable terms of it, says:—"Our operators are no longer mere mechanics. Mr. Robinson, in his "Brenda" and "Evening," really enters—and that as no novice, but a master—the domain of art. There are some fine examples of permanent pictures on opal glass, by a process which has been named, from its inventor, Mr. G. Wharton Simpson, the Simpsontype. Messrs. Mudd and Bedford have some very fine landscapes, charming in their soft detail and brilliance; and Mr. Blanchard some remarkable instantaneous views, wherein the very bursting of a wave has been rendered; and there are some large compositions, especially one of a musical party, which, for arrangement and accessories, are lessons to our best oil painters."

METEOROLOGICAL APPOINTMENT.—There is every reason to believe that the able and energetic Vice-President of the Photographic Society, Mr. Glaisher, will be appointed by Her Majesty's Government to succeed Admiral Fitzroy in the superintendence of the Meteorological Department of the Board of Trade. Few men, perhaps, either by natural qualification or high aquirements in science, especially in all that belongs to meteorology, and the cognate sciences, are so well fitted for the office, or deserve the distinction involved in such on appointment so thoroughly.

POPULAR PORTRAITURE.—Mr. Collins of Clonmel has just issued a capital portrait of Charles Bianconi, one of the celebraties of Ireland. This gentleman commenced life, a penniless Italian lad in Dublin, by self-help he gradually progressed, introduced a complete coaching system into that country, and is now a Justice of the Peace, wealthy, and respected.

PHOTOGRAPHIC ENTERPRISE IN THE STATES.—The correspondent of a daily paper writing from New York says:—A certain Mr. Gurney is a photographer of great local fame, and he has a rival, a certain Mr. Brady. This Brady has always been under the especial protection of the War Department, having been given access to battle-fields, captured cities, and other places of interest, when other persons of the guild found it impossible to secure such a favour. Now, Mr. Gurney conceived that it would prove a remunerative enterprise if he were to secure a picture of Mr. Lincoln's face, showing the dead President lying in state; and by some means, he obtained permission to do so, and made the photograph. This was hardly a decorous proceeding, you will think; and of this fact Mr. Brady took advantage. He knew that if Gurney were permitted to sell these pictures, he (Brady), would lose considerable of his reputation for enterprise, so he made such representations at Washington as induced the War Department to order the seizure of all Mr. Gurney's photographs of the face of the Presidential corpse. Thus "loyalty" was gratified, and personal loss evaded.

DOUBLES AND MULTIPLE GROUPS.—Messrs. Jenkins and Payne of Aylesbury send us a number of the cleverest multiple portraits of one person which we have seen. A number of very admirably arranged ordinary groups by the same gentleman attest great skill in this difficult branch, and explain how, in these "doubles," such effective combinations are produced.

FRENCH MEDALS.—At a recent meeting of the French Photographic Society, the following medals were awarded:—To Sir David Brewster, for his invention of the lenticular stereoscope; to Mr. Civiale, for his application of photography to the reproduction of mountains; to M. Dufournet and Co., for the invention of vessels in indurated cardboard for photographic operations; and to M. Laeessedat, for the application of photography to the drawing of plans.

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To Correspondents.

A. Taylor.—The easiest dry process, that is, the process by which the plates are most easily prepared, is, we think, the tannin process, as described by Mr. Hughes a few months ago, of which you will find a *resumé* in our Year-Book. 2. Turbidity in the varnish will cause the surface of the varnished plate to be full of small specks, and a few days subsidence is generally more effectual than filtering to remove this turbidity. Sometimes it is a peculiarity of the varnish to dry with the specks you describe.

G. R. B.—The *Saxe* paper referred to is plain *Saxe* paper, neither salted nor albumenized until it is floated on the first mentioned bath. The silver bath of 5 per cent. is a bath of nitrate of silver. The citrate of silver and chloride of silver are formed by applying paper first floated on a bath containing citrate of soda and chloride of ammonia, as described, on the bath of nitrate of silver. Read the article again carefully ; you will find it clear enough.

J. T. A.—The prints you enclose are from very thin positives on glass, not from negatives at all. It is probable that you do not half develop with iron, nor attempt to employ any subsequent intensification. To instruct how to take a negative would require several columns ; we can simply recommend you to refer to some good manual or to our Year-Book for formulæ. Briefly, we may recapitulate as follows :—make a negative bath according to recipe, employ the negative collodion of any maker of repute. Expose with your half-plate lens from 5 to 10 seconds in the open air with good diffused light ; develop with a 15-grain solution of sulphate of iron containing 20 minims of glacial acetic acid, and continue the application of this for two or three minutes, in short, as long as anything will come out. Wash well. Then apply a solution of pyrogallic acid 3 grains, citric acid 2 grains, water 1 ounce, with a few drops of a 20-grain solution of nitrate of silver added at the time of use ; apply this until sufficient intensity is obtained. Wash and fix. If the image still lack density, apply a solution of iodine 1 grain, iodide of potassium 2 grains, water 1 ounce, for a few minutes, wash and apply a fresh solution of pyro and silver. This may be done in dull daylight. By this plan you may obtain any amount of intensity. Try again and let us know the result.

Enquirer.—There is no *easy* way of separating the silver from old Daguerreotype plates, but it can be done if you think it worth the trouble and are familiar with such manipulations ; the method usually employed is to boil the plates in sulphuric acid, containing a little nitrate of potash, the proportion being about 3 lbs. sulphuric acid, 1 lb. water, and 1½ ounce nitre. The silver is then recovered by precipitating as a chloride with common salt. But it would be, probably, for you, a much better plan to sell to a respectable refiner. We cannot tell you anything about the price. You will find full instructions for recovering the silver from paper clippings, &c., in our last two Year-Books. We cannot enter into detail in this column. The value of chloride of silver depends much on its purity. If quite pure and dry, it is worth about three-fourths of its weight of pure silver. But the quality of such residues varies so much that it is difficult for a refiner to state a price, without testing the sample. Many of the refiners are, doubtless, honest and honourable.

No. 90.—Mixtures of old hypo and other waste solutions, containing silver, are to be treated with liver of sulphur to precipitate the silver as a sulphide, or they may be treated in Mr. Hart's silver save-all. Details have often appeared in our pages and our last two Year-Books.

H. B. Procter.—The front lens of a portrait combination, if used as a view lens, must be reversed ; that is, its concave surface must be turned towards the object. The front lens of a quarter-plate combination will, perhaps, cover a plate 6 by 5. 2. The position of the stop should be about one-fifth of the focal length in front of the lens. We cannot tell you the focus of the lens in question, but assuming it, probably, to be about ten inches, the stop must be about two inches in front of the lens. 3. The back lens will be unsuitable. 4. Much depends on whether you wish for slow, dry plates or extra rapid. For ordinary tannin plates, a good bromo-iodized collodion, containing about one grain of bromide and four of iodide in each ounce will answer well. For rapid plates bromide alone, is said to answer best. Read Major Russell's paper in our present number.

G. K. M.—It is a difficult and dangerous task to reduce the intensity of negatives, because, although it can be done, the exact degree of reduction is difficult to retain under control. If you apply a solution of iodine, the colour of the image and its degree of opacity to actinic light is changed. First it becomes olive green, and is denser than before ; then it gradually changes to yellow, and, finally a delicate primrose tint, in which state the deposit, however thick, is much less opaque than before. By watching these changes carefully it is possible to stop at that which will give the best result. A solution of bichloride of mercury can be used somewhat in the same way but with less safety. On the whole, unless the negative is useless, we should prefer to get softness by the mode of printing. Use a highly salted *Saxe* paper, a silver bath of moderate strength, and sun printing. Any attempt to reduce the intensity by means of cyanide is very dangerous to the half tones.

C. P.—Doubling the proportion of citric acid in the pyro solution will tend to prevent fog ; but your best plan is to employ the method we have so often recommended of using a solution of iodine between the application of the iron and developer and the pyro intensifying solution. 2. The tannin solution must be filtered. 3. As you do not say what is the nature of your failure in working the process described by Mr. Hughes, we cannot tell you its cause. 4. You had better follow his instructions literally ; but perhaps 2 grains. 5. Your lighting is very bad. It is chiefly in front of the sitter, and produces the flat effect in the pictures you enclose. Shut out the chief part of your front light and let your principal light be a high side light. Read Mr. Leake's paper in the present number.

Young Photo.—Your plan generally is very good, and if you have a well arranged set of blinds, will doubtless answer well. As a rule, at least 5 ft. over head, and the side of the sitter should be opaque ; but with your present plan, and blinds to shut out the light immediately over head, or at the side, and the power occasionally to use the light, you will probably have more convenience than if you made a larger space permanently opaque. For the south roof, you will probably require double blinds, and care must be taken that no aperture between the blinds let in streams of sunlight.

Thos. Collins.—We have not any personal knowledge of the lens to which you refer ; but believe the central lens is a positive lens, intended to shorten the focus of the combination. Perhaps of the names you mention, the last. We have conviction however, that the £16 half plate of the best English makers,is better than the £15 whole plate, of French make.

An Old Subscriber.—There is not any work specifically on landscape photography, we believe, in existence. Some years ago there was one, which is, we believe, out of print.

Slow Coach.—In the unfavourable position in which your studio is placed, the only remedy we can see is to raise your studio some 7 or 8 feet, so as to get higher than the walls which surround you in such close proximity. 2. So far as we can judge, an aperture of half an inch is not very small for the lens you name. We cannot at present tell you the particulars of the other lens to which you refer. They will, doubtless, be duly advertised when ready for distribution, or the maker will inform you. 3. It is quite necessary, to secure the best results, that no light pass through the copying lens except that which passes through the negative. 4. We prefer a weak solution of the sulphantimoniate, and are glad that your experience confirms our own as to its value. In a recent letter received from Mr. Lea, he strongly recommends chlorizing instead of iodizing the negatives previous to its application. It will duly find a place in the Year-Book.

A Country Amateur.—In speaking of the "bichloride of mercury developing solution," do you mean intensifying solution ? If so, dissolve 5 grains of bichloride of mercury in an ounce of water, apply to the negative until it is of a uniform grey colour, and then wash ; next apply a one-grain solution of iodide of potassium. There are several modes of using bichloride of mercury as an intensifier : but this is one of the simplest and best. We do not, however, recommend any of them.

D. Welch.—The idea is a good one. Thanks. We will use part of it.

H. C.—Your pictures are flat from employing too much front light. It is somewhat difficult at times to pose a stout old lady gracefully, but it is perhaps the least graceful of all to obtain a direct front view of face and figure without variation. Study the pictures of first-class photographers, and aim at some variety of lines in your pictures. You would do well to obtain a lesson or two in artistic posing from Mr. H. P. Robinson.

Old Photo.—We should have judged that the prints were from weak negatives and on paper excited on a weak acid silver bath. If the prints are better when the paper is longer floated, it is tolerably certain that the silver bath is too weak for the quality of albumenized paper you are using. A printing bath is better not acid at all ; it should be neutral or slightly alkaline to give the richest prints. Acetic acid makes the paper readily discolour, citric acid interferes with toning, and nitric acid still more so. Fuming with ammonia cures many of the defects of a bath not in good order.

E. Barraclough.—The specimen you send is a cleverly managed "double," or rather triple portrait.

T. Beverley.—The portrait of a man ascending a chimney 180 feet high is very interesting and cleverly done.

Nassau Jocelyn.—The picture last enclosed has certainly more relief than the former one. We are aware that to get the best light on a view is often troublesome, involving much waiting ; but it is the only mode of getting the best result. The use of a very small stop tends often to destroy the effect of relief ; perhaps that was somewhat the cause in the first view.

W. S.—For general stereoscopic work, especially instantaneous work, we should recommend the lens of six inch focus, to which you refer. For very distant objects, a pair of triples would, of course, give you a certain advantage in the size of objects in the picture ; but they would not be so rapid as the others, and, as a rule, scenes with distant objects only, and no near foreground object, are not effective stereoscopic subjects. Seeing that you have one triple for general purposes, we decidedly recommend a pair of single lenses of shorter focus for your stereoscopic work. Bearing in mind the considerations you mention, the work is very creditable, and the colour good.

W. J. Bovey.—Many thanks. We will write soon.

G. A. B.—Thanks. The specimens are capital illustrations of what may be done under suitable conditions, with simple iron development, without intensifying.

T. Ladmore.—The neglect was annoying and wrong. We mentioned it to the person concerned, and it is, we believe, now put right.

A. B., Manchester.—We fully agree with you.

Several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. J. P. Gibson, Hexham,
Six Photographs of Dilston Castle and Neighbourhood.
Mr. F. Snary, Castle Street, Bristol,
Portrait of Rev. J. A. Pratt.
Mr. W. J. Jennings, Market Harboro',
Portrait of Rev. F. P. Johnson.
Mr. W. W. Winter, 2, Midland Road, Derby,
Photograph of the Derby Life Boat.
Mr. J. Collings, Bute Street, Cardiff,
Ten Photographs of Newport River and Neighbourhood.
Mr. W. W. Law, Northampton,
Photograph of Queen Eleanor's Cross, Northampton.
Mr. J. Russell, Chichester,
Two Photographs of "Laying the Foundation Stone of the New Spire of Chichester Cathedral."
One Photograph of the Foundation Stone.
Mr. C. Clarke, West Street, Chichester,
Two Photographs of the Foundation Stone of the new Cathedral Spire.
Mr. J. Walker, Doncaster,
Portrait of Mrs. Vaughan.
Mr. E. Barraclough, Scarboro',
Portrait of Mrs. Barraclough.
West of England Photographic Company, Hereford,
Portrait of Dr. Kemp.
Mr. J. Hertz, Bradford,
Two Portraits of Mrs. Sarah Leach.
Messrs. W. and D. Downey, Newcastle,
Two Portraits of Rev. Blyth Hurst.

THE PHOTOGRAPHIC NEWS.

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A FEW HINTS ON PHOTOGRAPHY IN THE FIELD.

Wet and Dry Processes.—Tents and Boxes.—Cameras and Lenses.

After a protracted winter the season seems to have passed, almost without any transition, into a hot summer. Old landscape photographers are beginning to prepare for the field by getting their apparatus into order. Tents and dark boxes are brought out, and repairs or modifications made, or changing boxes and double backs are examined to ascertain that they are in good condition. The old photographer knows exactly from last year's experience what he intends to do and what to avoid in the coming summer; but the intending landscape photographer is in a state of considerable uncertainty as to what course he shall adopt. He is in doubt whether to work wet or dry plates; and as to what mode he shall adopt of working either. If he work wet plates he is uncertain whether to work a tent or a dark box; whether he shall envelop his head in the dark covering, or work with sleeves; whether he shall intensify and fix in the field: or merely develop, and then finish at home. If he desire to work dry plates he is quite uncertain which process to adopt; whether to walk in the old paths and try the collodio-albumen process which gives such magnificent results to Mr. Mudd, or to test the virtues of tannin, working according to the latest refinements of Major Russell, or according to the simplicity of Mr. Hughes; or whether, departing from the orthdoxy of either, and shunning alike "high" tannin and "low" tannin, he shall become sectarian or latitudinarian, and add honey, or malt, or glycerine, or albumen, or formic acid, or cherry brandy to his tannin. Possibly, a few general hints on the subject may aid the young landscape photographer in coming to a decision on all these points.

The first great question to be decided is, of course, that between wet and dry processes. The decision on this point must necessarily much depend on the intention and object in going about the work. If the aim be to secure the most perfect possible of landscape photographs, including every variety of effect, and that regardless of the labour necessary, then we venture to affirm, notwithstanding the fine things which have by some been produced on dry plates, that there is nothing comparable to the wet process, and that there are many effects which, notwithstanding the recent progress made in dry-plate photography, are only obtainable by the wet process. We leave out of the question, for the moment, instantaneous photography. That, as yet, belongs entirely to wet collodion. We have seen instantaneous results on dry plates—we have produced some ourselves—but we have never seen one which could be pronounced excellent without a qualification. "Very perfect, indeed, *for a dry plate*," is the highest eulogium which can honestly be given. But apart from instantaneous photography there are effects often very fine and desirable, which are only to be attempted with a wet plate. The most sensitive dry plate seems, in our experience—and in all that we have any certain knowlege of—to require a good light and well-lighted subject, in order to get delicacy, detail, and brilliancy. Dr. Hill Norris expressly stipulates that his extra-sensitive dry plates shall not be exposed in a bad light, as protracted exposure does not compensate for the want of a good light. Some of the most charming landscape effects are, with certain subjects, produced by pointing the camera almost in the face of the sun; but we should not think of attempting this with the best dry plate. Then apart from the advantages of rapidity, and sensitiveness to weakly-lighted subjects, there is the great charm of knowing what you are about, and what you have obtained. A plate is exposed on some choice subject, and, if the wet process be used, developed; the picture is charming; everything composes admirably; *but*—there is a *but*. A little more to the right or left would have brought in that tree to support the picture so much better; a figure placed here would at once have given the picture intention; those ducks which have glided slowly over the stream, unobserved, have spoiled the water—or twenty other things beyond control, and possibly unobserved, have marred the picture. The subject is so fine, however, that it is worth taking again, and with the wet process certainty is obtained. With dry plates, even with the utmost watchfulness and care, and utmost certainty in the plates, the quality of the effects must be slightly uncertain, and a knowledge of the result can only be obtained at home, when the charming view is many miles away.

But there is the great drawback of trouble. It is a serious undertaking to convey the means of working wet collodion in the field to its place of destination. We are speaking, of course, of the means to work plates of a reasonable size. There have been many ingenious plans devised of producing negatives little larger than the thumb-nail, with a view to future enlargement. This kind of waistcoat pocket photography is little better than child's-play. With the exception of a very clever manipulating camera large enough for single stereo-plates, invented by Mr. Barrett, of Reigate, and described in our first volume, and with improvements on p. 208 of our sixth volume, we have seen nothing of this kind which really possessed anything of practical value. The most portable of the contrivances for working wet plates in the field are those made on the principle of the dark box described by Mr. Blanchard on p. 459 of our seventh volume. This possesses the practical recommendation that it is really the manipulating chamber used by Mr. Blanchard in producing commercially all the instantaneous stereographs he has published. It is not suited, however, for working plates much larger than stereo size; although a modification of it described in our last volume admits of the use of larger plates. With this arrangement, it is Mr. Blanchard's delight to remark, he can work without assistance. He can pack the whole of his equipment in such a mode that he can sally forth alone and independent, carrying the whole of his traps himself, if need be, for miles. We must confess that to do this very frequently, under a burning sun, would require all the enthusiasm of an ardent photographer; but it can be done, and since photographers are very often gregarious animals, and go out in pairs, this labour divided might become light.

In many instances, however, landscape photography, although ardently pursued, is best done, especially in the midst of picturesque country, and when using large plates, by not making a toil of a pleasure. In such case it is better, as Mr. Thomas has suggested, to decide at the outset that porterage will be necessary. The assistance of a stout and willing fellow, as a rule, will be found invaluable in the field, and his aid will often well repay the disbursement of liberal largesse. Starting, then, with the admission that assistance will be necessary in conveying apparatus to the field, and useful when there, the question of a few pounds weight, more or less, does not become of such vital moment as the choice of the form of tent, which will be most convenient. This is a point on which much difference of opinion must always exist, as much depends on the mental and physical idiosyncrasy of the individual. One man is best satisfied when he is working in the compactest space, with everything within reach, without extending his arm. Another is not content without the fullest possession, not merely of the fact, but of the sensation of elbow room. Whatever be the form of tent chosen, we hold it of the utmost importance that it should possess, as indeed all field apparatus should, the fewest possible loose pieces, to admit of being left at home in the morning or on the field in the evening. The idea of Mr. Thomas's Box Tent is excellent in this respect; everything being packed *in situ;* it is easy to glance the eye over the contents before starting, and ascertain that everything required for work is there. In the boxes for packing the apparatus of several other tents the same facility exists, and all should be arranged so that an empty space would at once strike the eye as indicating something absent, which should be supplied before starting. The size and build of the operator should in some degree guide him in selecting his tent. A tall and stout man cannot, with much convenience, work in a small tent with the drapery gathered tightly about him and pressing on his head, so that with every movement he endangers the steadiness of the whole structure. Perhaps, for very tall or stout men there is nothing better than the tent proper, such as Smartt's and its modifications; a very convenient modification consisting in reducing the height of the whole, so that the operator shall sit to his work. But with all this class, it is very imperative, presenting such a surface to the wind as they do, to have cords and pegs for the purpose of steadying the erection. This is a precaution sometimes neglected, and disastrous consequences follow. In all the tents which consist partially of a box with drapery enveloping the person of the operator, it is a vital point, we consider, to have the portion immediately overhead well elevated, as first arranged, we believe, in those of Mr. Rouch, and since adopted by others. This gives at once more breathing space and room for moving without shaking the tent. The arrangement of the interior must, of course, much depend on the character of the tent; but in all cases we think the nitrate bath should be removed from the risk of splashes of water, developer, &c., either by being suspended quite away from the manipulating shelf or table, or being a few inches above it, instead of let into it, so as to bring its opening level with the surface of the table.

The question of water will always be a vital consideration with the wet-plate photographer, and where he has convenience for carrying it, a small tank or large india-rubber bottle should be taken full, from the nearest railway station, hotel, or farm house. Unless you are very sure of meeting with it of satisfactory quality on the ground, it is unsafe to trust to chance. The last time we were in the field there was a very fine piece of water close at hand; but it was almost impossible to get half a pint without accepting at the same time a score of tadpoles.

The question of tent or manipulating chamber being decided, the next considerations will be those of camera and lens. As regards the camera, of course, it is much a matter of taste; we have no hesitation in expressing our preference for one we designed ourselves, with bellows body and folding base-board, packing up into a very small space, extending, when necessary, to a considerable length, to suit lenses of different foci, very rigid and true in working, and very light. For negatives up to whole plate we desire nothing better, although there may be, doubtless, others as good which we have not tried. The description of ours will be found at p. 259 of our fifth volume: some important improvements have, however, been made since then. For large plates, perhaps, nothing more convenient and portable can be had than the modern improvements in the original Kinnear form; but in all portable cameras we urge it again, as of the first importance, to have as few loose pieces, screws, &c., as possible; and, above all, do not have, if it can be avoided, as in our small camera it is, a loose focussing screen to be constantly incurring the risk of loss or breakage.

Then as to the lens. We here approach difficult and dangerous ground, and, if we pronounce any absolute decision, *ex cathedra,* we are almost certain to be wrong; and quite certain to be thought wrong by many. To speak dogmatically on this subject would require a larger experience than any man we know of possesses. To pronounce definitely on the rival claims of the various landscape-lenses now prominently before the public, would require not merely to have the knowledge derived from one or two experiments with each, on the same subject and under the same conditions, but to have that derived from the use of each on same subject under the same conditions, and a still more extended use of each on dissimilar subjects, upon such subjects, and under such conditions, as might be best suited to the peculiarities of each instrument. And with this experience we should require, not the dictum of an individual, but a record of the judgment of several capable men. This kind of decision, we cannot obtain, and it is not necessary here, to take sides with either Capulet or Montagu. We can easily find rash persons, "Fiery Tybalts," who will pronounce, unhesitatingly, that this or that lens is the best in the world, without waiting for such data, or the best approach to it, obtainable, that is the experience of able men. But photographers know very well that any opinion on such subjects is valueless in proportion as it is rash and onesided. We can state one or two of the results of experience, not simply our own, which at best would be that of one man, but of the aggregate experiences of which in our editorial position we are the natural repository. As regards the single-view lens where simple landscape is required, and a limited angle of view is sufficient, nothing can be better. It gives, with good manipulation, crisp, brilliant pictures, well picked out, and with all the relief and light and shade, which is in the subject. But it will not properly include an angle of much over forty degrees, and if there be straight lines in the margin of the subject, they will be curved in the picture. Of the "Aplanatic" single lens we cannot, personally, speak with the same certainty, not having used it much. It appears to possess, however, the same general qualities as the ordinary single lens, and the power of defining a wider angle is claimed for it. We have seen very beautiful pictures produced therewith, in pure landscape; but like the single lens, although, it is stated, in less degree, it renders marginal straight lines with a curve.

This curvature produced by single lenses is only noticeable when straight lines are in the margin of the picture, and the lens has been used for producing negatives of the full size, for which the lens is intended. The triple lens has the advantage of rendering straight lines without distortion, and is especially suitable, therefore, for architecture; it also includes a much wider angle of view than the ordinary single lens, an angle of sixty degrees being, with proper care, well defined by it. If used in a dull light, or in unskilful hands, there is at times an absence of the crispness and "pluck" obtained with the single lens, although some of the finest landscapes we have seen have been produced by it, and, from its depth of definition and general qualities, the pictures are often very delicate and atmospheric. As regards the two newest lenses, the wide-angle doublet and the wide-angle single lens, what opinion shall we give? None, at present. We have seen good pictures produced by both, and heard some high opinions of both. We have not used either, as yet, ourselves; but hope to try both shortly; but so will many others amongst the ablest of our landscape men. In the multitude of counsellors there is wisdom, and we advise those concerned to look out for the opinions of unbiassed practical men, who have too much reputation to sustain to risk the expression of rash judgments, and who have no trade interests or foregone conclusions to maintain. Get a sight of the pictures produced if possible, and, failing that, be guided by the balance of evidence coming from the ablest men.

Our hints are extending to a greater length than we intended; so we must now leave off, and recur to the subject again. One word before leaving the subject of lenses. In choosing the stop, always use the largest that will properly define the subject, instead of the smallest possible, as is often done. The smaller the stop, the greater the loss of light, vigour, and relief. Don't sacrifice definition; but, that secured, aim at relief, vigour, and atmosphere, which very small stops often effectually destroy, producing a sharp map, instead of a pictorial landscape.

THE ORIGIN OF CARBON PRINTING.

A controversy as to the discovery of carbon printing has, from time to time, for years past, occasionally been carried on in the various photographic journals, and has been made to assume larger proportions than its intrinsic interest would have warranted, by the persistency with which it has been renewed, and the bitterness frequently imported into it. We are almost weary of the subject, we feel certain that photographers are also, and we now merely recur to it, and that very briefly, because we think we are in a position to settle it definitely by the production of the evidence which has often been demanded.

It will be necessary, and we shall do it very briefly, to recapitulate. In 1855, M. Poitevin discovered and patented a method of producing photographic impressions in carbon on paper. In 1858, Mr. Pouncy published a process of producing photographs in carbon on paper. Both these processes were based essentially on the same principle, viz., the action of light on a mixture of a chromic salt and soluble organic matter, in rendering the organic matter insoluble, and capable of holding or imprisoning a colouring matter of carbon or other pigment; the principle having been discovered and published by Mr. Mungo Ponton, in 1838. Mr. Pouncy, or his friends for him, or both, has, from time to time, asserted that he was the originator of carbon printing, basing his argument on the ground that no one (of course no one whom he knew or had had communication with) had seen one of M. Poitevin's carbon prints, and that there was no evidence that, although he had published his process, he had ever produced anything by it. The argument based on the assumption that no one had seen one of M. Poitevin's carbon prints of 1855 now falls to the ground: we have four before us as we write.

We know that for those sensitive to open vituperation or, strange to add, private slander, this is a dangerous controversy to engage in. Want of patriotism, in upholding the claims of a foreigner, has been one of the commonplace charges frequently made. But truth is of no country; the heroes of science and benefactors of mankind belong to the world. M. Poitevin possesses a name too honourably associated with photographic discovery for any lover of the art to disregard his claims. He has, in our pages, from time to time, seen these extraordinary pretensions, and although tempted, at times, to answer them, he has, being closely engaged with more important subjects, left the matter, feeling his reputation safe in the common sense and just feeling of English photographers. He has now, however, more for our satisfaction, and in recognition of our fair defence of his claim, felt that it was due to us to place before our eyes specimens produced in 1855, the existence of which have so often been denied.

The specimens which M. Poitevin has forwarded for our inspection consist of a print from a half-plate portrait negative, a view of a factory (we believe that at which M. Poitevin was then chemist and engineer), and two small reproductions. All are rough and with the imperfect characteristics of first essays, but with full indication of the promise of the process. The memoranda written on two of them are as follows:—"Premieres epreuves de photographie au charbon, Gouhenans, 1855;" the others have the same date, and similar words, and all are signed "A. P." So far as such things can do so, they possess internal evidence of their age and character. It happens, somewhat singularly, however, that there is other evidence on the subject. A long trial, which has been closely contested, has just been settled in France, in which, after a very complete investigation of claims, it has been decided, before a high legal tribunal, that M. Poitevin is the inventor of carbon printing, and that there is evidence that his productions were publicly noticed in 1855. We shall not now say anything further on the subject, as we regard this evidence as settling the historic question without the possibility of further question or cavil. It is probable that we shall exhibit the specimens at some photographic meeting, before returning them to M. Poitevin, who naturally treasures them as the first results of the discoveries in carbon printing, photolithography, and helioplastic engraving, in which he and others have made so much advance since.

ART AND PHOTOGRAPHIC ARTISTS.

BY JOHN E. CUSSANS.

As last Sunday afternoon I was walking along the Euston Road, my attention was attracted to a show case which stood at a photographer's door. There, of course, was to be seen the ubiquitous gentleman, swart of complexion and curly of hair, clothed with the distinguishing badge of a free-mason; and there equally of course were the pictures of Laroche illustrating two episodes in the courtship of a young man apparently from the rural districts. It was not these however that arrested my attention, for they are to be seen at the doors of fifty similar establishments, and I was already too familiar with them to bestow more than a passing glance: but there, in the post of honour, in the centre of the case, framed, and most vigourously coloured, I beheld one of my own earliest productions. I stopped for a moment, and the indefatigable doorsman, imagining from the interest which I evinced in the specimens, he might find in me a prospective customer, approached and blandly solicited my patronage, "only sixpence, sir, in this style. Step inside sir, you won't be detained two minutes, the *hartist's* just disengaged." I certainly felt rather annoyed to see one of my pictures so exhibited, and turned to the man to expostulate against it; but a glance at the photograph in question and another at the touter, showed me that they were both such wretched, sorry specimens, and so eminently adapted to each other, that I passed on uncomplaining. The doorsman's invitation, however, was not entirely lost upon me; for, as I threaded my tortuous way between the perambulators and orange girls with which this locality seems to be peculiarly infested, his last words still rang in my ears—'the hartist's disengaged'—and my thoughts naturally ran on art and photographic artists.

That photography in the hands of competent practitioners, is indeed worthy of being accounted a fine art, I think no one at the present day, who is capable of forming an opinion, will have the temerity to deny: but to assert that all those who obtain a living by its practice are artists, would be preposterous,: for many are not even photographers—they are but clumsy mechanics, ignorant alike of the optical and chemical causes by which the effects are produced, and of those nicer and more subtle requirements which no amount of study and practice can possibly teach unless the mind be peculiarly fitted to receive them.

No wonder that those should be found who have treated lightly the claims of photography to be ranked amongst the fine arts, when ignorant and unscrupulous men profess themselves as its exponents, and unblushingly dub themselves *artists*; but is it just to condemn an art, because a few of its professors are unskilled and incompetent? As well might we declare that music and painting are not fine arts, because an automaton figure can produce the one and a child the other.

Were photography merely a reproductive art, were its functions limited solely to rendering faithful transcripts of plans or designs requiring no original thought or creative power on the part of those who exercised it, then would it indeed be but a mechanical art. But happily this is not so. Granted, that an operator, after repeated trials, may be enabled, with tolerable certainty, to produce pictures irreproachable in point of manipulative excellence; but if this be his sole aim and attainment, he is certainly far from being an artist. Some time ago, Mr. Mudd exhibited a particular landscape which was deservedly admired, inasmuch as it was possessed of all the essential points which should be found in a photographic picture; but very few were aware of the thought and pains which had been bestowed upon it. While focussing, the practised and artistic eye discovered that, charming as the view was in other respects, it lacked vigour and contrast of colour in the foreground, which Mr. Mudd rectified by placing a large stone (which he was obliged to carry from a long distance), in the required position. Now, herein lies the difference between an artist and a mechanic. The latter would have been content to have represented the view with uncompromising fidelity; but the former, perceiving in what respect the composition was deficient, judiciously corrected it.

So too, the man who, from whatever cause, fails in the purely mechanical part of his art, is equally disqualified from bearing the title of *photographic artist.* "We protest," writes the Editor of the News, in a recent number, "against the notion that good art is best secured by bad photography." The operator may be largely possessed of that intuitive perception—taste; but if he be unable to express it, of what service is it to him or others? Many a village fiddler might have, with proper instruction in the materialities of his art, been developed into a musician—the divine afflatus might have been there, culture alone was wanting. Though the artist may regard grace in the arrangement of his models as a paramount consideration, yet the perfect rendering of that arrangement, by the means of which he is possessed, ought to be no less a part of his duty.

Photographers there are—many, too, who have "artist" engraved on their door plates—who regard their sitters simply as slides to be placed in a magic lantern: the light is turned on, the image projected, and the operation is over. But when a photographer, after studying his subject—for every individual is, or ought to be, a separate study—places him in such a position, and in such a light, that his best "points" only are brought out, carefully subduing those which are less pleasing, and when the surrounding accessories are so arranged that they lead up to, instead of detracting from, the principal object—when all this is conjoined to executive ability—then, and then only, can the operator lawfully subscribe himself *Photographic Artist.*

De Quincy says, "A miscellaneous audience is best conciliated by that sort of talent which reflects the average mind;" and it is probable, that, from this cause, photographers as a body have been content to exercise their art on subjects inferior to those of which it is capable. A certain amount of realism has always possessed great charms for the multitude in their consideration of art. It was highly amusing to listen to the criticisms of the spectators at the Exhibition, on the "Reading Girl." Nearly everyone made identically the same remarks, so that a blind man might have imagined that they were reading a label attached to the statue. "Isn't the book natural? It has real letters on it; and just look at that broken rush hanging from the bottom of the chair." The subleties of a very accurate rendering of nature, the public are apt to overlook or to misunderstand, probably from insufficient study of the object sought to be represented, but a portrait in which the material and pattern of a person's dress are clearly to be discerned, generally meets with approbation, and thus photographers who look mostly to the general public for support have, in the majority of cases, set themselves too low a standard, and have not achieved those results which they might otherwise have done.

In proportion as a student discovers in what true excellence consists, so will his standard of perfection be raised; and in the same ratio will he be enabled to discover his short comings. This axiom will be found to hold good in every case in which study and reflection are indespensable requirements. For example:—to one who is unacquainted with the laws which regulate the game of chess, the movements of two players are quite imcomprehensible; but when the first principles have been explained, and the student is master of Scholar's and Fool's mate, he fondly considers that he will soon become a brilliant player: it is not until after months, or it may be years of patient study that he is enabled to discover how very little he really knows of the science, and how great a distance there is between himself and a Staunton or a Morphy. "Fools oft rush in where angels fear to tread;" and in like manner the veriest tyro in the photographic art will frequently arrogate to himself the title of *artist;* not because he is worthy to bear it, but simply because he is ignorant of its true signification and requirements.

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ANALYSIS OF SILVER BATHS.

BY MM. BARRESWILL AND DAVANNE.

The nitrate of silver baths employed in photography to prepare the various sensitive surfaces, become greatly impoverished by use, in consequence of their employment having the effect of converting bromides, iodides, and chlorides, contained in the preparations upon which they act, into insoluble salts of silver sensitive to light. There is, therefore, an interest in being able to ascertain by a rapid process the real strength of a silver bath. In daily practice, this interest exists particularly with positive baths, which quickly undergo a considerable reduction of strength; but for baths intended for negative preparations, the interest is less.

Now one litre of collodion contains from 10 to 45 grammes of soluble iodides, the mean equivalent of which may be represented by 2130, that of nitrate of silver 2124. From this we may perceive that the 10 to 45 grammes of iodides and bromides contained in one litre of collodion weaken the sensitizing bath only to the extent of 10 to 15 grammes of nitrate of silver. Now, in practice, we know that before using this quantity of collodion, we should use more than one litre of the bath, which contains 70 to 80 grammes of nitrate of silver, the weakening will, therefore, not be in proportion to the diminution of volume, and will have no sensible influence upon the operations.

If, in these circumstances, we desire to bring the bath to its original volume, it will suffice to employ solutions of a strength about one-tenth greater than the original solution. If we desire strict exactness, we must employ one of the processes here recommended.

Among the various methods of analysis which have been proposed, we mention, first, to wholly reject it as incorrect, the *argentometer*. An argentometer may be sufficiently correct for operating upon new and pure solutions; but it will lead to error if the solution contains foreign salts, and this occurs in a high degree with all photographic baths which have been used, as they then contain alkaline nitrates, resulting from the decomposition of nitrate of silver.

Neither do we admit the method founded upon the *apparent volume* of a precipitate of chloride of silver; for this chloride is precipitated in a different state of tenuity, according to the nature of the solutions, so that we cannot then deduce the weight of the volume obtained.

We conclude, therefore, that if we wish to arrive at a proper quantitative estimate, we must employ either the easy and quick process of measurement by a normal liquor, or by the direct weight of the chloride of silver.

Analysis by Volumes.—The trial by volumes is made by a solution of salt, of such strength that a given volume exactly corresponds to a known weight of nitrate of silver. Now the test liquor we employ contains a quantity of chloride of sodium, such that ten cubic centimetres precipitate 0·50 grammes of nitrate of silver. This method of analysis by volumes is adapted only to solutions which contain no fixing agents (alkaline hyposulphites, cyanides, sulpho-cyanides) is based upon the fact that one equivalent of chloride of sodium (730·37) precipitates one equivalent of nitrate of silver (2124) in the state of chloride of silver. The best liquor is prepared by dissolving 17·19 grammes of pure and perfectly dry salt in distilled water, the volume of the solution must correspond very exactly to one litre, at the mean temperature of 66° Fah.; in these conditions, ten cubic centimetres of this liquor precipitate just 0·50 grammes of nitrate of silver in the state of chloride.

The necessary apparatus for this mode of analysis, are:—

a. A graduated measure of 250 cubic centimetres; or,

a. Litre measure; it serves to prepare the normal liquor.

b. A Gay Lussac's burette, graduated in cubic centimetres and tenths of a cubic centimetre.

c. A pipette of ten cubic centimetres.

d. A precipitating glass, which may be replaced by a glass tumbler.

The burette *b* is often replaced by a more convenient arrangement, known as *Mohr's burette*, and also by the *argentometer*.

*Analysis of Positive Baths.**—The normal liquor being prepared as described above, take, with the pipette *c*, ten cubic centimetres, which are dropped into the precipitating glass *d*, then add two drops of a saturated solution of bichromate of potassa. Most frequently the necessary quantity of the bichromate of potassa is previously added to a litre of the test solution, about one gramme per litre, to give it the tint of a solution of chloride of gold.

On the other hand, we fill the graduated burette up to zero, with the nitrate of silver to be analysed, then let fall, drop by drop, the solution into the precipitating glass, where it becomes mixed with the normal liquor. It immediately causes a white precipitate; by a regular movement of the left hand we cause the liquid to turn in the glass, while with the right we pour in the liquid to be analysed; towards the end of the operation, each drop of nitrate of silver produces, in falling, a large red spot, which immediately disappears; at last, a drop suddenly gives a permanent crimson tint to the liquid, and then the operation is concluded.†

We have now only to read upon the burette the quantity of liquid poured out, and to divide the quantity by fifty to ascertain the strength of the bath.

Knowing how many operators there are who shrink from calculations, we give herewith a table, by means of which they may ascertain the proximate strength of a bath.

It will be sufficient to read in cubic centimetres upon the burette the quantity of silver solution employed to tinge the normal liquor of a bright red colour; then to seek this number as near as possible in the first column of the annexed table, and the corresponding figure in the second column shows the strength of the nitrate bath: that is to say, the quantity of nitrate of silver contained in 100 cubic centimetres of the liquid.

Table of the Analysis of Silver Baths by means of the Normal Salted Liquor.

10	cubic centimetres	dropped from	the burette	show a bath of	5	per	100.
8·330	"	"	"	"	6	"	"
7·142	"	"	"	"	7	"	"
6.259	"	"	"	"	8	"	"
5·550	"	"	"	"	9	"	"
5·000	"	"	"	"	10	"	"
4·545	"	"	"	"	11	"	"
4·166	"	"	"	"	12	"	"
3·840	"	"	"	"	13	"	"
3·571	"	"	"	"	14	"	"
3·333	"	"	"	"	15	"	"
3·125	"	"	"	"	16	"	"
2·941	"	"	"	"	17	"	"
2·777	"	"	"	"	18	"	"
2·634	"	"	"	"	19	"	"
2·500	"	"	"	"	20	"	"

To give still greater facility, we have constructed a special argentometer burette, conforming to this table upon which the strength of the silver bath may immediately be read. Dr. Van Monckhoven has modified the employment of this test liquor by reversing the operation, proceeding in the following manner:—Take ten cubic centimetres of the bath to be analysed, and pour it into the precipitating glass; fill the burette up to O with the test liquor. The liquid immediately becomes red; stir it continually, and continue to pour in the test liquor until the red colour completely disappears. We then read upon the burette the number of cubic centimetres employed; the strength of the bath is just half this number, if we employ our best liquor. If we prepare it by putting double the quantity of salt to the litre, the strength of the bath will be just equal to the number of cubic centimetres employed. In this modification, the test point is perhaps more easily detected.

(To be continued.)

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MAGNESIUM.

BY E. FRANKLAND, ESQ., PH. D., F.R.S. &c., &c.*

In the years 1807 and 1808, Davy, carrying on his investigations in the laboratory of the Royal Institution, upon the chemical agencies of electricity, discovered the metals of the alkalies and alkaline earths. He was well aware of the great importance of his discovery in a purely scientific point of view, but it certainly never occurred to him that substances, which cost him so much labour to obtain in minute quantities, would ever become objects of industrial manufacture. Davy's discovery, however, only demonstrates for the thousandth time the fruitfulness of every substantial advance in abstract science. How often have we seen such a discovery become to industry a new lever of advancement, and how frequently does an isolated and, to many, apparently a dry and unimportant scientific fact, suddenly and forcibly rise into prominent notice, under the auspices of those whose function it is to apply the result of the philosopher's labours to the utilities of life.

In the hands of Bunsen in Germany, Deville and Carron in France, and Matthiessen and Sonstadt in England, the reduction of magnesium, one of Davy's new metals, has been gradually elaborated into a manufacturing process, which promises to become of great importance for certain special applications of light, even if it should not eventually be rendered available for the general purposes of illumination. The ores of magnesium are amongst the most abundant of the materials constituting the solid crust of our planet, whilst the waters of the ocean contain in the aggregate a vast amount of this metal in the form of Epsom salts and chloride of magnesium.

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* This mode of analysis is that to which we give the preference.

† The formation of this red chromate of silver indicates that the liquid no longer contains chloride of sodium. The ten cubic centimetres of the normal liquor contain 0·1719 grammes of it, equal to 0·50 grammes of nitrate of silver. To arrive at this result, we must therefore drop into the precipitating glass a quantity of the positive bath, corresponding to 0·50 grammes of nitrate of silver.

* By permission from the *Journal of Gas Lighting*.

Immense stores of magnesium exist in dolomite, or magnesium limestone; this stone, of which the Houses of Parliament are built, containing almost exactly 12 per cent. of the metal. In addition to these sources, magnesium also occurs in considerable quantity in a great number of minerals, of which steatite or soapstone, meerschaum, and asbestos, may be mentioned as instances. The metal itself is always prepared from the chloride of magnesium—a salt which is not easily obtained in such a state of purity as is required for its successful reduction. Deville and Carron purify this salt by mixing it in solution with chloride of ammonium, evaporating to dryness, and heating the residue until it melts. The chloride of ammonium is used to prevent the loss of hydrochloric acid during the evaporation of the salt, but although chloride of ammonium is volatile at a temperature considerably below redness, yet even prolonged heating generally fails to expel the last traces of this salt, which, if allowed to remain, exercise a very prejudicial influence upon the quality of the magnesium. Mr. Sonstadt has recently overcome this difficulty by dispensing with the use of chloride of ammonium altogether, and substituting common salt in its place. He recommends that the solution of the mixed chlorides, which must be first carefully freed from sulphuric acid, should be evaporated to dryness in a silver vessel. The dried material is then to be placed in a platinum crucible, loosely covered, and heated to full redness. When it enters into tranquil fusion the operation is complete, and the fused mass may be poured out upon a clean cold iron plate.

The substance thus obtained is now in a fit condition to be reduced. For this purpose it is placed along with one-fifth of its weight of sodium in an iron crucible, with a closely fitting cover, and heated to full redness. On removal from the fire, the cover should not be taken from the crucible until the latter is nearly cold. The mass is now removed from the crucible, and washed with water until the salts surrounding the magnesium are dissolved. The metal must then be placed on a porous slab, and dried at a temperature not exceeding that of boiling water. The magnesium thus obtained requires purification, either by fusion with perfectly dry chloride of magnesium, or by distillation in an atmosphere of hydrogen.

It is thus evident that at the present moment the metallurgy of magnesium is somewhat tedious and complicated, but it is by no means improbable that further investigation will reveal some method by which advantage may be taken of the volatility of magnesium to prepare the metal pure at one operation, in a manner similar to that long used in the reduction of zinc from its ores; in fact, the two metals are so similar in their chemical character that the metallurgy of zinc cannot fail to afford important guidance in all attempts to simplify that of magnesium.

Magnesium is a brilliant silver-white metal, somewhat brittle at common temperatures, but malleable at a heat a little below redness. Its specific gravity is 1·74; or, bulk for bulk, it is somewhat lighter than ivory. It melts at a full red heat, and volatilizes at about the same temperature as zinc. Its lustre remains unimpaired in perfectly dry air, but in a damp atmosphere it soon tarnishes, and becomes covered with a film of magnesia. The most important property of magnesium, however, is the facility with which it enters into combustion, whilst the phenomena which it exhibits in burning are in the highest degree interesting in connection with certain technical applications. When magnesium in the form of thin wire is heated to redness in air it takes fire, and burns with a dazzling bluish-white light. Magnesium wire may be easily ignited by the flame of a candle or spirit-lamp, but the combustion is apt to be interrupted, owing to the falling off of the ignited end of the wire, unless the latter be continually pushed forward into the flame of a small spirit-lamp, which serves to re-kindle the magnesium should it become extinguished. The wire burns best when its ignited end is inclined downwards at an angle of 45°.

These conditions for the continuous combustion of the wire have been secured in the lamp shown in figs. 1 and 2. Fig. 1 exhibits a side, and fig. 2 a front view of the magnesium lamp, the different parts of which are denoted by the same letters in both drawings. For use in this lamp the wire is coiled on a reel, which fits upon a stud prepared to receive it (C, fig. 1). D is a small hand wheel, attached to an endless screw, working into a cog-wheel, E, attached to one of a pair of rollers, EE, which draw the wire from the reel, and project it through the tubes, F, where it is ignited by the spirit-lamp, G. The lamp shown in the figure is made to burn three wires simultaneously, but it is obvious that the number of tubes, and consequently of wires, may be increased or diminished at pleasure, and to render the lamp self-acting, a simple form of clock-work motion must be applied to the wheel, D. The tray, H, serves to collect the ashes of the magnesium, R being a concave reflector.

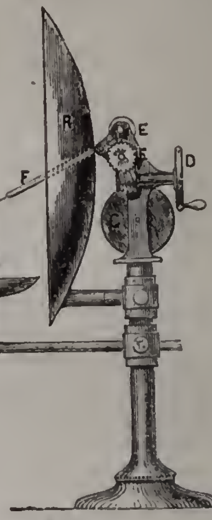

Fig. 1.

Such are the present contrivances for rendering this remarkable metal available as a source of light. Let us now examine into its applicability, first, for illuminating purposes: and secondly, for photography. The light emitted by burning magnesium, when examined by the prism, is found to contain all colours—in other words, like the electric light, gas light, and candle light, but unlike sunlight and Way's mercurial light, it gives a continuous spectrum. There is a preponderance of rays at the most refrangible end of the spectrum of the magnesium light, which gives to it a bluish tinge—not sufficiently marked, however, to render it objectionable for general illuminating purposes. The continuous spectrum of light proves that it is capable of showing all the colours of the objects which it illuminates, although, from the preponderance of blue rays, some colours are slightly modified. Thus yellows are rendered brighter, blues and greens are intensified, and reds become somewhat purple. These modifications of colour are, however, far less marked than those produced by gas and candle light, and we may therefore safely conclude that, as regards quality, the magnesium light is well fitted for the general purposes of illumination.

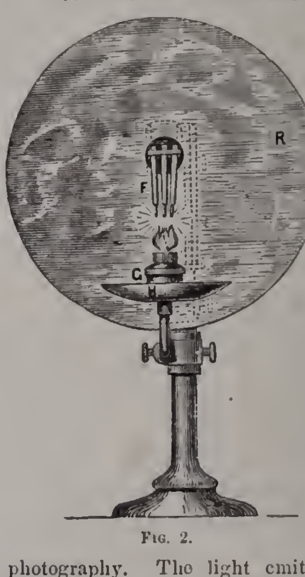

Fig. 2.

(To be continued.)

THE RELATION OF PHOTOGRAPHY TO THE FINE ARTS.

BY JOHN MORAN.*

Although the claims of photography to membership in the family of fine arts have been often pleaded with warmth and skill, they are still denied, the present occupants of the temple of beauty yet refusing her admission, though the capacities of the edifice are ample, and contain room and verge enough for all.

This refusal to rank photography among the fine arts, I consider, is in a measure unfounded, its aim and end being one in common with art. It speaks the same language, and addresses itself to the same sentiments. It is our simple and unselfish delight in the contemplation of nature, which is the foundation of all the beautiful or fine arts, and which distinguishes them from science or mechanic arts. The cathedral, in so far as it is merely useful, is a work of science; but as it combines other qualities which are addressed solely to the imagination, it is a work of art. Of course, photography can never claim the homage of the higher forms of art; for, in the actual production of the work the artist ceases, and the laws of nature take his place. But it is the power of seeing and deciding what shall be done, on which will depend the value and importance of any work, whether canvas or negative. Dryden says, "The most important thing in art is to know what is most beautiful." Now, this first and most important knowledge the photographer must have, equally with the painter. The exercise of the artistic faculties are undoubtedly necessary in the production of pictures from nature, for any given scene offers so many different points of view; but if there is not the perceiving mind to note and feel the relative degrees of importance in the various aspects which nature presents, nothing worthy the name of pictures can be produced. It is this knowledge, or art of seeing, which gives value and importance to the works of certain photographers over all others. There are hundreds who make chemically faultless photographs, but few make pictures; but though painting calls for talents and capacities not demanded by the photograph, and which necessarily give it a much higher rank, yet that should not exclude our art from the class to which it belongs. There are relative degrees of excellence in all modes of art. From "Hamlet" to "Auld Lang Syne," or the "Transfiguration" to a chalk drawing, there is a wide interval; yet each is a work of art. A proper classification of photography will be of advantage to all parties, whether maker or buyer. If our works are not art, the sooner we know it the better, that we may turn our best efforts away from the production of beautiful pictures, and study how we can be useful as an advertising medium. The amateur may learn that he is wasting his time, and should sell out at once. The public may learn that they are throwing their money away in filling folios, or decorating parlours.

There are three heads under which may be classed all the various kinds of human work, namely, Science, Mechanic, and Fine Art. They, again, like light, are capable of further subdivision. Now, photography is certainly a human work, and must therefore come under the wing of one of the three. As a branch of science it does not seem to fulfil the requirements of either form of science, *i.e.*, the speculative or practical. In the first, knowledge is its only aim; but, if pursued for some ulterior end, it is called practical, or, as the Germans say, bread and butter science. Geology may be studied as a means of tracing the history and changes of the earth's crust, or as means of developing coal beds, or coal oil; but though a little science be necessary to the production of photographs, and they, again, may be some aid to science, yet the motives which induce the highest aims of photography, an end which it accomplishes (the delineation of the external aspect of nature), have nothing in common with the aims of science. We may therefore dismiss its claims under that head, and see what fellowship photography holds with mechanics. A mechanical art I define to be "a physical means to a materially useful end." Physical utility is its distinguishing mark; but the best and most beautiful photograph may claim the pre-eminence of being as useless as even the Apollo Belvidere; so that, tried by a utilitarian test, we have but frail chances of admission to the workshop.

We thus find, negatively, what photography is not. Our next consideration will be, what are its positive claims and analogies with works of art?

There are three dogmas of art by which it may be tried, namely, Imitation, Truth, and Beauty.

1. Imitation. Quatremore De Quincy thus defines imitation in art: "To imitate in the fine arts is to produce the resemblance of a thing, but in some other thing, which becomes the image of it." That condition the photograph fulfils to the letter.

2. Truth. The word truth, as applied to art, does not mean, necessarily, the full and complete record of all the phenomena existing in an object, but concordance with the object in what is stated. The statue-engraving, ink-drawing, or photograph, though all lack colour, are still true representatives, in so far as they go. All human truth is but relative; so that the failings of the photograph, as compared with the painting, does not exclude it from the fine arts, because its utterance is limited; besides, the manner of its production is confirmation of its truth.

The third ordeal will be, can photography produce works which call forth the ideas and sentiments of the beautiful? I hold that she can; but to a better understanding of the way in which this is accomplished, it will be necessary to look into a knotty question or two, touching the relation of mind to matter. Philosophers tell us that it is through the agency of the senses by which we attain to knowledge and ideas of external nature and its various phases. It is our delight. In the contemplation of these ideas, upon which is founded all the imitative arts; the form, colour, and activity of nature, is a never-ceasing source of wonder and interest to us. Now, it is the proper business of art to produce those images of nature which call into active power that class of thoughts which we denominate "feelings of the beautiful," "theoretic ideas," "æsthetic faculties," and many other names, which all mean the same thing. I therefore take beauty to be simply a name given to a certain class of feeling, which may be called into action by form, colour, or symbol. Now, a faithful image of combinations of nature, which are pleasing or beautiful, will similarly affect us, though much less in degree, where there is great capacity of mind. The real mountain is a nobler object to Byron than the painted one.

For the above reasons, I think we may claim for the photograph the ability to create imagery which call forth ideas and sentiments of the beautiful.

To recapitulate, photography is not science, for it teaches nothing in that sense. It is not a mechanical art, for it does not produce articles of use; but it fulfils three of the principal conditions of a fine art, all of which, I think, entitle it to rank as a member of the family of fine arts.

Virtually, the great mass of the public do acknowledge it as such; or, how else can we explain this immense expenditure of money in transcripts of nature, or reproductions of art? What traveller returns from Alpine glacier or Venetian architecture empty handed? But not only have photographs a value in recalling past scenes or associations, even to the minds of those who cannot meet this far-off nature face to face. She can present imagery with a reality and force nearly rivalling the painter, and, in some respects superior.

I will say a few words, not strictly to the question. It is a very common error, that all we need do to see, is to look. Even some of our "star lights" seem to have the same opinion; but in looking at works of art we see not alone with the eyes; the object must be illuminated from within;

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* Read before the Philadelphia Photographic Society.

otherwise, all things, whether of nature or of art, are but dead, inanimate matter. We had an example of this mental blindness in Mr. Beecher's late lecture on Beauty and the Beast, wherein he complacently surveys the living British art, and exclaims, with the *sang froid* of Sir Charles Coldstream, "there is nothing in it." But we may well question whether it was the mind or the art, which was empty.

> *Hamlet.* Mother, look; do you see nothing?
> *Queen.* Nothing; yet see I all that is.

Mr. Beecher did not suspect the spirit behind the canvas. To close, I would beg leave to call the attention of the Society to these questions, to the end of a further interchange of opinion, for on these depend the right direction of our individual efforts, and the general advancement and position of photography.—*Philadelphia Photographer.*

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A FEW HINTS ON THE BEST MEANS OF OBTAINING GOOD CARTES DE VISITE.

BY D. WELCH.

[Mr. Welch informs us that he has found great advantage from distributing copies of the following hints amongst his customers. The advice contained in them is so excellent that we reprint it for the benefit of our readers, who may wish to carry out the same or a similar idea.—Ed. Photo. News.]

"Good morning, Miss Green."

"Good morning, Miss Park."

Miss Park.—You are early dressed and abroad this morning.

Miss Green.—Yes; I am going to Mr. Artist to sit or stand, or perhaps both, for some cartes, and Mr. Artist appointed 10 o' clock as the best time for getting good ones.

Miss Park.—Would it not be better in the afternoon?—wait until 2 o' clock, or 3 o' clock, and I will go with you.

Miss Green.—Here are a few hints to persons intending to get their cartes taken, which Mr. Artist gave to me. I will read them. Go early in the day when you are fresh after the night's repose, and the morning wash, before you have got fatigued by being busy, or by doing nothing during the day; before you have met with some annoyance which any person may meet with before afternoon, and which will, very likely, show on the countenance, and change the expression. Go early, when the photographer is fresh after a night's sound repose, and before he has met with some nervous, restless sitter or spoiled child, to try his temper and his patience, for if the artist is in good humour, you will be more likely to have a pleasant expression than if the contrary is the case. Go also alone, or with one quiet friend, who will retire when the plate is being exposed. More depends upon this being attended to than is generally supposed. If you have a number of friends with you, or one laughing, giggling friend, who will keep you constantly laughing and talking, you will not get a good likeness. Why do so many ladies complain that the artist has made them blind in their cartes? Simply because they take a number of friends with them, and keep their nerves so excited that they cannot keep perfectly quiet, and the slightest movement destroys the expression of the eyes, and of the whole countenance. Another reason is, when there is a number of friends in the studio, the artist cannot arrange his blinds properly, as he cannot see how the light will fall upon the sitter, as some person is sure to be obstructing some of the lights, and he can only go by guess. The arrangement of the light is most important—in fact, the most important of the whole process, as no two persons almost will bear the same light. Some persons will bear much more light on the face than others; some will bear more side-light, some require more top-light; others require more front-light to give the proper expression to the face. Therefore, go alone, and give the artist fair play, and if he does not give you a good likeness, then blame him. In dressing, remember, that in photography, blue is light, and red or orange is dark; and therefore, the more blue anything contains, the lighter it will be, and the more red or orange anything contains, the darker it will be. Thus, purple, violet, mauve, magenta, will be light, because they contain a large proportion of blue; scarlet, brown, and olive green, will be dark, because they contain a large proportion of orange or red; blue-green or sea-green will be much lighter, because it contains a much larger proportion of blue. Another thing to be particularly observed is, that whatever reflects back light comes out white, such as the polish on boots, the gloss on silks, oil on the hair, &c.; hence black hair with much oil will come out as if gray.

Miss Park.—Have you got a copy of the hints to spare?

Miss Green.—I have not, but I will get a copy for you from Mr. Artist.

Miss Park.—Thank you: good morning.

Miss Green.—Good morning; and I will also get a copy for Mr. Goodall, as Mr. Artist says that gentlemen are quite as nervous as ladies, and require to attend to the same hints.

Miss Park.—Thanks.

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THE STUDY OF ART NECESSARY TO THE PHOTOGRAPHER.

BY CALVIN THURBER.*

In portraiture a good negative depends upon three things, viz., a proper disposition of light, an appropriate attitude of the model, and a good chemical effect. The degree in which the first two conditions are fulfilled must depend upon the amount of artistic feeling possessed by the operator, and a failure to meet those conditions in some degree is proof of a deficiency in those fine perceptions which must ever mark the true artist from the mere mechanic.

But when we come to consider the very slight attention bestowed upon the subjects of light and position, in a really artistic sense, we are surprised at the degree of merit which we many times find displayed, though this merit only goes to prove the yet undeveloped powers of our noble art, for its exhibition is the exception, not the rule.

Among students of painting the art of light and shadow is considered of no less importance than that of colour, and it is entirely just that it should be so; for it is upon that happy arrangement of light and shade that the artist must depend for vigour, relief, and all lifelike effect, for all pictorial attempts owe their chief value to that felicitous disposition of light that shall give to each individual part of the picture its proper emphasis and force.

It is a knowledge of the subtle powers of chiaroscuro, or the science of light and shade, united with correct perceptions of form, that will ever be sufficient to place a man in the first rank among painters. Without this knowlege, though he may be able to colour like a Titian or a Claude, still the simple ability to colour will fail to confer immortality upon his works, or true greatness upon himself.

Now, there is no branch of art where art of light and shade plays a more prominent part than in photography; everything depending upon it and upon form, for no defect can there be glazed over by a veil of deceptive colour; everything there is simple, severe, and straightforward truth, and the least departure from that truth is painfully felt.

Yet, notwithstanding their importance, photographers seem to have bestowed very little attention upon the subjects of light and position, or, at least, not that attention which they deserve. Few of them have thought it worth their time to study the works of the masters, with the direct object of applying the results of those studies to their everyday practice. It is true that the class is comparatively small which can have the advantage of a systematic course of study from the originals of the masters and teachers of art, but the land is full of worthy copies, good engravings, which embody all that is of value to the photographer. Our print stores teem with a host of subjects worthy of our attention, as regards light, shade, and position.

To prove the importance of this branch of study to our art, we have only to compare a poorly-lighted and poorly-positioned photograph with some fine copy of a Reynolds or a Lawrence, and we shall see at once what a field we have to traverse before we can attain to that exquisite combination which we find in those copies. In the copy there is not a shade that can be taken away without detracting from the beauty and perfectness of the whole; not a light that can be marred without destroying the completeness of beauty, for they are all, even to the slightest touch, the result of an extended knowledge, growing out of a life-long study and experience. I am confident none will deny that the work from the camera is susceptible of being made as beautiful and truthful as that copy of Reynolds or Lawrence.

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* From the *American Journal of Photography.*

It is true that the air of exquisite refinement, of dignity, of noble pride, or tender love, with which the master's pencil can invest his work, the photographer cannot always hope to attain, for every model with which he has to deal is neither a nymph or a hero—nor are they all even graceful men and women. But, notwithstanding the fact that all sitters cannot be posed in strict accordance with the laws of classic beauty, still I claim that in every individual there resides a certain gracefulness and dignity which will show itself when they feel at perfect ease, and it therefore becomes of no small importance that the operator should have the tact to place his sitter at perfect ease; and if, in addition to this, he distinctly knows what a truly graceful position is, he will almost invariably catch the best position which the sitter is capable of assuming.

The quality of imparting to the sense of ease and freedom must depend upon a native politeness carefully cultivated, united with an intimate knowledge of human nature, that instantly understands the particular treatment required by each individual case. This knowledge and politeness can be gained only by careful study and constant practice.

That other quality, of knowing what the truly beautiful is, can be made ours only by patient study of the best specimens of art that may come within our reach, if not the original paintings, then the best copies of the best artists, remembering that the disposition of light, and the grace of position, which we there find, is the result of the accumulated knowledge, observation, and experience of ages, and of an extended study, such as the practical photographer could never find to follow out by actual experiment.

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THE OPALOTYPE.

BY CHARLES A. SEELY, A.M.[*]

Several years since, when the picture now known as the Ectograph was occupying my attention, I acquired a considerable practical experience in the processes now used for producing porcelain pictures. Some of the most important conclusions arrived at in these experiments are as follows:—

1. No development process gives uniformly satisfactory results in the dark parts of the pictures. It is very difficult to secure clearness and definition in the shadows.

2. Of development processes, the albumen is to be preferred to the collodion process. The tendency to fog is less, and the process is more certain. The albumen process is, however, much slower and more troublesome in manipulation. But while too slow for the camera, it is well suited for contact printing.

3. The best results are obtained by direct contact printing, either with chlorised albumen or collodion.

I have now almost daily opportunities of confirming these conclusions from the porcelain pictures which come under my notice. Nearly all of these pictures are made on collodion by development, and they almost invariably betray their origin in a general fog and a confusion in the shadows. I have never seen a clear and vigorous picture developed on collodion. The only porcelain pictures so made, which can at all compete with paper prints, are such as have been made from thin negatives, or with collodion of feeble intensity.

In direct contact printing on collodion I found difficulties; the greatest perhaps was the dissolving of the image in the fixing solution. But when all works well, there is no plain photograph which can compare with such a picture. The printing-frame used was such as is now used by some for the porcelain picture.

Mr. Simpson's process, described on another page, so far as I know, is entirely original with him, and probably will yield as good results as the old chlorised collodion processes. Unfortunately, the ordinary porcelain glass, on account of the unevenness of surface is not adapted to contact printing.[*] Until we have perfectly flat glass, I despair of seeing good opalotypes, except such as have been improved by the artist.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 24th May, 1865.

M. Davanne has published a photographic annual or year-book, under the title of *Annuaire Photographique*, for 1865. The object of this publication will be best explained in his own words:—To collect in a convenient form a host of useful memoranda, which photographers would have to search for either in special treatises or in various journals; to complete these instructions by the authors' own experiments; to give an account of the various works of the year past, and describe the more important among them; to describe the several foreign and domestic photographic societies, their organisation, their exhibitions, the prizes they award; to enumerate new books; describe the processes most in vogue in a general formulary arranged so that every one can modify them at his pleasure; and thus to condense the most indispensable information within the compass of a few pages. This little book does not pretend to teach theoretical and practical photography, nor to replace formal treatises or periodical works; it simply aims at giving the operator, without commentary or explanation, the figures, numbers, and formulæ he may require, referring him to the book or journal, where he will find any important process described in detail.[†]

This *Annuaire*, small in size, carefully printed upon strongly sized paper, is as convenient for the pocket as for the operating-room table—blank pages are left for the insertion of any new formulæ and memoranda, too frequently lost from being written upon detached slips of paper. It is proposed to continue the work annually.

M. Dubroni has contrived a pocket photographic apparatus, which combines a camera and dishes in one piece, so that it is possible to sensitize, expose, and develop the collodionized plate, without changing its position.

The body of the camera is formed of a sort of flattened globe of yellow glass, open at the two extremities of its smaller diameter, and kept in a fixed position by means of a frame formed of four pieces; the front aperture carries the objective, moved by rack and pinion; the back aperture is fitted with a frame for carrying the glass plate.

In working this apparatus, after coating the glass plate in the usual manner, it is placed in the focus of the lens, and sensitized. This operation is performed in the following manner:—an india-rubber ball, to which an aluminium tube is fitted, is filled with the necessary quantity of nitrate bath; the tube is then introduced into the camera, through a hole in the upper portion of the camera, and by pressing on the india-rubber ball, the liquid flows out into the lower part of the globe. Then the camera is gently tilted, so as to cause the nitrate to flow over the collodionized plate, and to remain a few seconds in contact with it.

By examining the plate through the sides of the globe which constitutes the camera, it may be ascertained when the oily appearance on the surface of the plate has disappeared. The silver solution is now withdrawn, the plate exposed, and then, by means of another india-rubber ball, the developing solution is introduced into the globe camera. The development proceeds in the same manner as the sensitizing. Intensified, if necessary, the plate is removed from the camera, fixed and washed in the open light.

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[*] From the *American Journal of Photography*.

[*] This is remedied now in this country.—Ed. P. N.

[†] It will be seen that this *Annuaire* is based upon the idea originated in our Year-Book.—Ed. P. N.

All the articles necessary to the several preparations required by this apparatus, as well as for the converting the negatives obtained into negatives are collected into a case of small bulk.

M. Lœwe has prepared some paper which serves both for transferring proofs and for the multiplication of negatives, so as to obtain a ready means of printing transparent positives, in every case where the positive replaces the negative as a screen.

This paper is sensitized in the usual manner, and afterwards cylindered between two sheets of paper of the same sort. We print upon the back of the prepared paper until it has assumed a metallic aspect; it is then washed and fixed in hyposulphite of soda, or in sulphocyanide of ammonium.

To print negatives from a positive obtained upon this paper, the proof is varnished with mastic varnish, and then applied on glass.

We can also establish a positive on glass, and print negatives from it upon this paper.

Coated with uranium collodion, it dries in two or three minutes, and gives, under the press, very beautiful and vigorous proofs. Uranium collodion prepared in the following manner always gives good results:—

Saturate the collodion with nitrate of uranium; what remains at the bottom of the bottle may be dissolved in fresh quantities of collodion; the first portion being saturated and decanted, pour it upon half its volume of nitrate bath, of the strength of 15 per cent., and filter it through cotton. It is immediately ready for use.

Our seventh photographic exhibition is now open. The collection, though smaller than usual, is quite as interesting as any of its predecessors. Carbon printing occupies a prominent position, and shows remarkable progress during the past year. Beside the familiar names, as exhibitors, of Poitevin, Swan, and Despaquis, we have a series of proofs of remarkable excellence from M. Blaize de Tours and M. C. Toulier.

The portraits, less numerous than usual, are, for the most part, very excellent, especially the enlarged pictures taken by Dr. Van Monckhoven, Hermagis, and Thouret. In landscape, the productions of Soulier, Civiale, Paul de Londres, and the Viscount de Banville, are conspicuous; and the studies of M. Rousset deserve special mention. It is gratifying to perceive how photography is gradually enlarging its boundaries, not only in a mechanical point of view, but also in the artistic. As a reproductive art, superseding engraving, it is continually making rapid strides to perfection. M. Bingham exhibits a fine series of proofs taken from modern works of art, while M. Angerer, of Vienna, sends an admirable collection from the works of the old masters.

Heliographic engraving is well represented in the productions of MM. Marie, Placet, Pinel, Lemercier, and Mante; and photographic enamels are contributed by Lafon de Carmasac and Poitevin. M. Dagron is strong in his clever microphotographic jewellery; and M. Delton presents us with an interesting series of studies of the equine race. A more detailed examination of the works exhibited may probably call for further remarks.

M. Claudet has recorded in *Le Moniteur de la Photographie* the result of an examination of the enlarging apparatus of Dr. Van Monckhoven and of M. Liebert. He says, M. Liebert's apparatus is distinguished from all other enlarging cameras by the suppression of the reflector, and the direction of the condenser to the source of light. It is evident that this arrangement presents an immense advantage over Woodward's Solar Camera. It admits of our following the sun, as with a telescope, during all seasons and all hours, while that luminary is above the horizon. The rays fall direct upon the condenser with all their power, for, not being reflected by a mirror, there is no loss of light. The suppression of the mirror has another great advantage, that of enabling the operator to concentrate an image of the sun upon the middle of the objective of the camera without distortion, forming the most perfect of daphragms, which is very difficult to accomplish with an ordinary mirror of large dimensions, formed of material rarely homogeneous, more or less coloured, and expensive to construct with sides mathematically parallel.

When it is necessary to employ a smaller surface, it is easier to obtain colourless glass in conditions which render it suitable for a good optical instrument, and then its perfection depends upon a well calculated construction. By suppressing the reflector we avoid distortion in the image, the absorption, more or less great, of the photogenic rays, according to the colour and thickness of the glass, and the loss of light by reflection. We can, without risk of error, state that, with equal dimensions of condenser, M. Liebert's system produces more than twice as much photogenic light than Woodward's system with reflector. By this means, the production of the image is accomplished in half the time, which admits of our obtaining enlarged photographs upon preparations similar to those employed for printing without development. In this manner we obtain results full of vigour, of a rich and uniform tint after toning with chloride of gold to the hue of the best direct photographs. M. Liebert's apparatus is, therefore, calculated to spread the taste for enlarged positives, and to give to photography a new and profitable direction, of which it has much need. With regard to art, the enlargement of portraits, views, and copies will have numerous applications of the greatest utility. M. Liebert has rendered a great service to photographic art by the ingenious combination of his solar camera, and may be congratulated upon his invention.

THE NEW WIDE-ANGLE LANDSCAPE LENS.

Sir,—The first portion of Mr. Grubb's letter, contained in your last issue, needs no reply.

If that gentleman conceived the idea, and actually constructed a landscape lens composed of three lenses, and in this respect similar to mine, I certainly, never heard of it until I read his statement.

With regard to the second portion of that letter, in which Mr. Grubb refers to my not having given the reasons for the superiority of my new landscape lens, I may observe that the paper read by me at the meeting of the parent society, was simply descriptive of the instrument I then exhibited, and the use for which it was intended, added to which was a brief account of its origin.

In a concluding paragraph, it is true, I indicated the advantages derived from the use of a second crown lens of different optical properties to the first, especially referring to the more perfect correction of the excentrical pencils. For, by dividing the refraction between two such crown lenses, not only more perfect achromaticity of these pencils is secured; but the additional or second contact surface affording a greater angle of incidence, is an element for flattening the field, and thus admits of closer approximation of diaphragm, or stop, which diminishes distortion.

With regard to correction of spherical aberration of the axial, or central pencils, I am not aware of having claimed any advantage, as Mr. Grubb appears to imagine.

Had it been my intention to read an optical paper on the lens in question, I should have entered more fully into the subject. But conceiving, as I do, that the photographic public, generally, are far more apt to judge by results than from theoretical considerations, I purposely abstained from entering into details; and to this end, I append the result of the experience of a few practical men. I may remark before doing so, that whilst, in preparing my last paper, it was written less with a view to instruct opticians than to afford information to photographers, when I have time, I contemplate writing a paper on the optical principles involved in my new lens, in which I shall enter more fully into the questions on which Mr. Grubb seeks information. I now add the opinions referred to.

Mr. Bedford, who tried one of my new lenses, against one of Mr. Grubb's, pronounced the instrument a success, and a most useful addition to his stock of lenses.

Mr. Wilson, of Aberdeen, writes:—"As yet, so far as I can see, it is the best landscape lens out."

Mr. England, who tried one the other day, immediately ordered three, for use on his tour abroad.

Mr. Robinson writes:—"The new lens is a marvel. The largest stop might be used for an 8 × 5 plate, without any great loss of sharpness."

I might quote others, but think the above sufficient to show that the new lens is already appreciated as a wide-angle landscape lens by some of our best artists; and the opinion of these gentlemen will probably have more weight with photographers than anything I could say for, or Mr. Grubb urge against, my new landscape lens on theoretical grounds. I am, sir, your obedient servant,

J. H. Dallmeyer.

19, *Bloomsbury Street, W.C., May* 23, 1865.

Sir,—In the last number of your journal is a letter from Mr. Grubb, of Dublin, on the subject of Dallmeyer's new landscape lens, which, as coming from the inventor of another lens for similar purposes, is, I think, in the very worst taste. There is a very old adage, to which I would call Mr. Grubb's attention, viz., "The proof of the pudding is in the eating." Now it appears perfectly clear that Mr. G. has not applied this kind of proof (I don't mean eating the lens, which would, I fear, prove very "hard cheese"), but has written a condemnatory letter, without having either tried the lens or seen the results produced by it. Now, as I happen to have seen two views, I am in a position to state that, although Mr. Grubb has failed in producing a lens which fulfils all that Mr. Dallmeyer has claimed for his own, the latter gentleman has been more fortunate. The views I allude to were taken with a lens of $6\frac{3}{4}$-inch focus, and the base line is fully $9\frac{1}{2}$ inches; they are perfectly sharp and good to the extreme edges. I am not aware, although I examined the lens, at what distance the stop is placed in front, but it is certainly not so close as to injure the image in any way. So far as I could perceive, the angle covered was 70°, and although I have used several of the aplanatic lenses, I have not found one which would embrace more than 55°.

I may add that I saw views of the same subject (farm out-buildings) taken from the *same spot*, by the new lens, and also the No. 1 triplet. The former covered fully 15° more than the triplet, and was shorter at the extremities.

On the question of price, on which Mr. Grubb lays some stress, Mr. Dallmeyer's lens is ——* for the 10 × 8 plate; less, I believe, than Mr. Grubb's charge for one of the same size.—I remain, sir, your most obedient servant,

Baynham Jones.

Cheltenham, May 24th, 1865.

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Bromides and Chlorides in Dry Plates.—Dr. Vogel explains that as bromine and chlorine powerfully absorb iodine, the presence of bromides or chlorides in dry plates, in which all the free nitrate of silver is removed, will necessarily aid sensitiveness, and will, moreover, allow of development without free nitrate.

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* We suppress the price here for obvious reasons.

Talk in the Studio.

A New Peril for Photographic Tourists.—We announce with regret a serious peril to a well-known photographer and member of the Committee of the North London Photographic Association, Mr. W. J. C. Moens. This gentleman, as many of his friends know, started, some time ago, accompanied by his wife and a friend, on a photographic tour in Italy. A few days ago, whilst photographing between Pœstium and Salerno, he, in company with his friend, Mr. Ainstie Murray, was seized by brigands and detained. Mr. Murray was set at liberty, in order that he might endeavour to obtain ransom for Mr. Moens from his friends; a sum of £8,000 being demanded. This sum, enormous as it is, will, we understand, have to be paid. Whether any redress can be obtained from the Italian government, we are unable to state.

Look after Your Lenses.—Mr. R. H. Dyball, of 3, Lower Terrace, Notting Hill, sends us an account of a very coolly-impudent attempt at robbery in his studio. He says:—"A fellow coolly walked into my glass room, which is at the rear of the house, in the garden, a distance of about 30 yards from the main road, and attempted to take my C. D. V. lens off the camera, but it being of a cone construction, he could not get it through the flange aperture. He then, it appears, tried to wrench it off. Finding that attempt useless, he takes camera and all, and walks off with it under his arm, whistling as he went down the passage. Fortunately, a young person connected with my establishment saw him, and called to me, in the reception room, to know if I was aware a man had just gone out with a camera under his arm. Of course I was soon out after him, and saw him running down a turning out of the main road; I gave chase, and caught him about a quarter of a mile away; a policeman came up, and I gave him in charge. The case was heard at Hammersmith, in the afternoon, and remanded for further enquiries until three o'clock to morrow (Wednesday). In the Brixton case, reported in the News, it was stated that a portrait of the fellow was obtained, would it be possible for me to see a copy to compare with this man, as I believe him to be a practised hand."

[Can our Brixton correspondent afford Mr. Dyball a sight of the thief's portrait.—Ed.]

Berlin Photographic Exhibition.—We learn from our friend, and confrere, Dr. Vogel, that the exhibition at Berlin is a decided success, and is exciting much interest. Mr. Robinson's "Bringing Home the May," and other compositions, are exciting unbounded interest, all being especially charmed with what Dr. Vogel styles the "glorious picture" first named. We hope shortly to give more details of the exhibition. We may add here that we are commissioned by Dr. Vogel to inform English exhibitors that their contributions have all been duly received and displayed.

Printing Frames for Opal Glass.—We have received recently two printing frames for use with plates of glass, which will permit the examination of the print to ascertain the progress of the printing, without risk of moving or blurring the image. One is made by Mr. Billcliff, of Manchester, and the other by Messrs. Mawson and Swan, of Newcastle. In the first, the negative (this is made for a quarter-plate) is held in its cell by springs pressing against the edge of the glass, whilst the opal glass is held by sliding bars with springs, with power of adjustment for three sizes of plate. In Mawson and Swan's, the negative (half plate) is also held *in situ* by springs, and the plate of opal glass (also half-plate) by a screw. In both the exact return of the opal glass to its former position on the negative is guaranteed by the two halves of the frame being attached by well-fitting hinges. We think that, in both, an additional safeguard, easily applied, will be valuable, as the best of hinges will, in time, get a little play. Let one half have a couple of metal pins, and the other a couple of metal sockets, into which, when closed, these pins will fit. This will render the accurate closing of the printing frame, without the slightest displacement of either negative or print, certain, even if the hinges become a little loose. It would be an advantage if each frame could be made to take, at least, two or three sizes of negative and opal glass. It is a common thing to require a quarter-plate, or less, bust, from a whole-plate negative, and the frames should be made to afford facilities for this and similar work. Both the frames are good, and with the modifications we have suggested will be still better. We shall probably notice them again after further trial.

Paris Photographic Exhibition.—From what we learn this exhibition is not up to the mark of former years in interest or excellence, and does not much illustrate progress in the French capital. One very charming large portrait of a lovely girl, by Angerer, and an exquisitely—beautiful child's head by Bingham, are said to be the gems of the exhibition.

Photography and the Affections.—Leigh Hunt, in the most charming of all his essays, tells us that in the family in which a child has died there is an eternal infant. But, by the aid of photography a family may have an eternal infant without the intrusion of death. By having his children photographed once a year Paterfamilias may, for a trifle, preserve all the looks they ever wore—Jack's progress from the juvenile pinafore to the shooting coat and the turned-down collar of manhood—Miss Mary's growth through all its charming stages, until she enslaved the heart of Tomkins, the stockbroker, and was by him carried off proudly to a new home, of which she is at the present moment the grace and the ornament. In every way, and at a cheap rate too, photography aids all the best and the most affectionate feelings of our nature. The widow values the letter which she received from her son in India or China, but she values far more the *carte* enclosed. On the little bit of pasteboard stands the boy himself, so much grown, so much more manly looking than when he went away, and with, perhaps, a little bit of tropical scenery brought in by way of background or adjunct, making the thing yet more real. And then, to all young people who are lovers, photography is a mighty boon. Through the aid of Sir Rowland Hill "Love wafts a *carte* from Indus to the Pole," and with the face of the beloved one always before you, constancy, both in man and in woman, becomes a virtue comparatively easy to practise. Photography tends to subdue all excess in the passion. If Juliet could have sent her *carte* to Romeo, it is not likely that that young gentleman would have climbed over garden walls, raved about the moon silvering the fruit-tree tops, and exposed himself to detection and the swords of the Capulets. Photography will prevent the poets of the future from writing passionate addresses to absent fair ones. Every hero will have the heroine's *carte* in his pocket.

To Correspondents.

⁂ We have to claim the indulgence of some of our Advertising Friends, whose announcements stand over for want of space.

G. Rowe.—It is very likely that your bath, worked as you describe, has acquired a large amount of organic matter. If you have facilities to boil it, that will be best. If not, place it in an open vessel in some place where you can maintain a temperature of, say, 150 degrees, for some hours, then neutralize and sun, next filter, test, and make the proper strength; then, after adding a trace of nitric acid, it will probably work well again. 2. A room with only top light, arranged as you describe, is somewhat difficult to work in and secure good lighting, but still we think it possible. The card enclosed has the effect of being taken with too small a quantity of very poor light. A brighter light with the same arrangement, or a little more light with a similar arrangement, would have given you a rounder, more relieved, and brilliant picture.

F. B. E.—The viscidity of your silver bath arises, we presume, from albumen dissolved from the paper floated on it, when getting too weak. The viscidity cannot very well be removed without precipitating the organic matter, and a certain amount of silver with it; but the trouble it causes can be very much mitigated by mixing with an equal quantity of new solution. 2. We have never met with such a case as you describe. What kind of varnish had the negative been varnished with? 3. Resinized paper is not intended to supersede albumenized paper. It is intended as a substitute for plain paper pictures, giving more vigour and transparency in the shadows than plain paper without the resin. For large pictures, a more pleasing surface, and more artistic results are obtained with it than with albumenized paper.

W. O.—The preparation of diaphanie varnish is, we believe, a trade secret. Personally, we have had no experience in the practice of that accomplishment.

Amateur X.—The numbers of the Photographic News you mention are in print. 2. We believe that the same method may be employed with all toning baths still containing gold. Your statement of the operations is quite correct. The *rationale* of the operation is this: the gold in a very fine state of subdivision is attacked by the chlorine in the chloride of lime, and forms chloride of gold. The process of boiling drives off all free chlorine, which otherwise would bleach the prints. The exact strength is immaterial. 4. The phrase "sunning down obtrusive lights" simply means that when a print has left the pressure frame, and it is manifest to the artistic eye that some lights are too prominent, or that an accidental light has found its way into the picture, which detracts from the prominence due to some other light, or which destroys the general harmony, the remainder of the picture is covered up, and this light portion exposed to light until it is sufficiently reduced in prominence. There are various modes of doing this, which a little ingenuity will suggest, but making an aperture in a piece of card to permit the light to pass through whilst the card is kept in motion to prevent forming hard edges will answer. 5. Your question, "Which is the print of a negative?" puzzles us. Please state your question in other words. 6. It is possible to enlarge from a negative direct on to paper without first making a transparency and then an enlarged negative; but the exposure in an ordinary camera, even with development printing, is very long. You will find the proper address of the News Office printed on the last page of each number.

Louis Dolibo.—The simplest mode of precipitating old baths, so as to recover the silver, is to throw down the silver as a chloride with common salt, taking care not to add excess, which would partially redissolve the precipitate. For a pint of a 30-grain nitrate solution, half an ounce of salt will be ample. Hydrochloric acid may also be used. In what sense do you find that common salt "won't do?"

P.—A slight surface deposit or fog, which may be rubbed away with the finger, may arise from several causes; most commonly it arises from organic matter in the nitrate bath; sometimes from the bath requiring a little more acid; sometimes from excess, in the bath, of nitric acid. If everything else be working well, and this deposit is only slight, the addition of a little more acetic acid to the developer will sometimes remove the defect. Sometimes the use of an old developer will effect a cure. If these fail, and the bath is known to have sufficient acid, the best plan is to neutralize and sun it. 2. We are not fond of a dark room from which even yellow light is stopped out; but if you cannot get more light, you will get accustomed to work with very little light after a little practice.

Failure.—Your chief source of failure arises from using an unsuitable collodion on an unprepared sample of paper. With some samples of collodion, made from the powdery pyroxyline, the collodio-chloride may be used with unprepared plain paper; but with tough and horny samples, the mottled result of imperfect adhesion is produced. This collodion is, moreover, defective in another particular, we fancy; it appears to yield a slightly opaque or opalescent film, instead of a film as transparent as glass. It is possible that the addition of water has aggravated both the original evils of the collodion. The dingy lights, mottled surface, and general mistiness would be produced by these defects in the collodion. We believe the firm you mention are now preparing an article expressly for the purpose, but we have not tried it.

H. B., of K.—To vignette pictures by the solar camera, interpose a large piece of card with an oval aperture between the enlarging lens and the screen on which the enlarged image is projected, somewhere about midway between the lens and the screen; if a gentle motion be given to the card with the aperture, the gradation of the edges will be more perfect. As the card is moved nearer the screen, more of the image will be cut off, and as it is removed from it, of course, more of the image will be printed.

φως.—The sample of collodion is evidently unsuitable; it is much too skinny and contractile, and is, we fear, not quite free from opacity, or opalescence, which gives the picture a buried, or misty appearance. We have not met with as much cracking or loss of films with all our experiments. We cannot say, with certainty, the cause of the small bubbles which issue in white spots. We have met with them, to a slight degree, once or twice, and then fancied they arose from using the collodio-chloride too soon after it had been thoroughly shaken up, and when it was full, therefore, of small air bells. We regret the difficulty which exists in amateurs, or even professional photographers, beginning at the beginning, and making their own collodion, testing each sample before mixing a large quantity for use. This is the mode in which we went about the matter, and we cannot say much about the suitability of various commercial samples of plain collodion. We believe that some manufacturers of collodion are giving their attention to the production of the preparation complete, but have not yet tried any examples of such.

W. S., Nottingham.—Your portraits are decidedly beyond the average of amateur work, the chief improvements being necessary in the printing. With the paper you mention we believe the manufacturer stipulates expressly for the use of silver bath not exceeding 40 grains to the ounce, so that when you use 60 grains you introduce an element of error. Drying excited paper by a hot fire is very apt to make it discolour, especially when there is great excess of free nitrate, and when acetic acid is used in the preparation, as is the case, we believe, here. To avoid mealiness, let your toning bath be riper when you use it; keep it not less than four or five days first, and try half the quantity of chloride of lime. A little more direct side light, and less diffused light or top front light would be better. In No. 6 the negative is decidedly too weak. To get a deeper tone, let the prints remain a little longer in the toning bath. Some of the prints, No. 7, for instance, would have been better deeper printed. It is not an uncommon circumstance for toned prints to turn very brown when first immersed in the fixing bath, and subsequently to recover their purple tone. Your background is a little too dark.

A Subscriber.—We will endeavour to do so; but, as Major Russell remarks, it is difficult to lay down precise formulæ in a process which requires the exercise of judgment arising out of experience to meet varying conditions; and the rapid tannin process seems to be in this position. The general details of the process are given in Major Russell's work, of which full abstracts as to working details have appeared in our columns.

J. Titteaton.—We shall have pleasure in seeing the "solar autographs."

Several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. J. Atkinson, Danby Walk, Leeds,
Two Photographs of Mrs. Atkinson (female pedestrian).
Messrs. Waawick and Brookes,
Design for Back of Carte de Visite.
Mr. Thomas Heritage, Bow Road,
Three Photographs of Ancient Coffin found Batow.

THE PHOTOGRAPHIC NEWS.

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A FEW HINTS ON PHOTOGRAPHY IN THE FIELD.

Selection of View—Exposure—Development—Preservation of Films Moist, &c.

On the selection of the subject, and the time of day for working the arrangement of light, &c., we do not intend here to enter at any length. The choice of subject must necessarily depend much upon the aim and intention of the picture secured, whether it be intended as a record of the spot, a foreground bit as an aid to other studies, or the production of an artistic picture. Assuming the latter to be the case, we would make one or two suggestions. To secure the best pictorial result, it is desirable, if possible, to reconnoitre the ground first, with a view to ascertaining the pictures it contains: and in doing this remember that whilst a tree, a rock, a cottage, &c., may form very valuable foreground objects, the delineation of any one of these on a large scale right in the middle of the picture, is altogether beside the purpose of picture making, and that a judicious "composition" of many objects will generally give the best pictorial result. In selecting the picture the practised eye will readily determine, pretty accurately, the amount of subject which his lens will include, without much measurement or calculation. It is, moreover, tolerably easy, where a fair view of the circle of the horizon can be gained, to measure with the eye, to a few degrees, the amount included in any given space. If, for instance, your lens include an angle of forty-five degrees, it is very easy to determine that amount; a right line from the eye straight in front of you to the horizon, and another line, at right angles with this, to the right or left, will be the boundaries of an angle of ninety degrees, and this halved, of course, gives the amount the lens in question will include; and in like manner the amount of the landscape before you, which will be defined with other lenses, may be approximately measured. For greater accuracy, a small view-meter will be found valuable, and this should admit of adjustment to indicate the amount which each lens to be used will include.

The hour of the day selected, must necessarily depend much on circumstances, and will be governed largely by the light required by the subjects respectively. For many reasons, early in the morning is frequently the best time. In securing foliage, the wind is perhaps the photographers' greatest enemy, and early in the morning, before seven or eight o'clock, there is generally less wind than when the day is further advanced, and, at the same time the atmosphere is frequently clear, and the light actinic. Some landscape photographers we know, prefer at all times to expose before two o'clock in the afternoon, from a conviction that the quality of light declines so sensibly after that hour, even in the midst of summer, as to affect the value of the pictures. Others are fond of the long shadows obtained when the sun is declining towards the horizon, a time at which magnificent clouds are often secured. But whatever the time of day chosen, it is important that the subject be properly lighted. For some subjects, the sun immediately behind the camera, may give a good light, but in by far the greater number of cases, a side light is the most effective. Sometimes with certain subjects, the lens may be pointed in the face of the sun; but this is a plan only adapted for special effects. For nine subjects out of ten, the best effect will be obtained with the sun shining on the subject, so as to form a combination of side and front light.

The question of exposure is one on which we receive many queries from the young landscape photographer. Nothing very definite can be said about it, except, to recommend that the exposure shall always be sufficient. A short exposure, with foliage, must almost inevitably produce a bad picture. Nevertheless there is a great temptation to young photographers to run into this error. From some almost unexplained cause, many photographers seem to have acquired a notion that short exposures were something to boast of. We remember on one occasion, conversing with a very worthy gentleman, who worked the tannin process. In general conversation on the subject, he spoke of the exposures as simply a matter of seconds. On asking the direct question, how long have you given the plates exposed to-day, the answer was "six minutes!" Another gentleman working dry plates said, "I have given this plate between three and four minutes;" he had guessed or counted the time; but by our watch he had really given over six minutes. It is a very difficult thing to gain any accurate idea of exposure, without actual experiment. Perhaps we may state very generally, that, with a lens of twelve inches focus, half inch stop, and good light an exposure of fifteen seconds would probably be found ample with chemicals in good condition; but of course the condition of the latter, the kind of subject, and the time of year, will very much modify the matter. A properly exposed, and carefully manipulated negative, will be covered all over more or less with detail, and the bare glass, if any, will not be found in spaces larger than could be traced with the point of a graver.

As a rule, the collodion and bath which will give good results in portraiture, will work well for landscape work, and the same iron developer may also be used frequently with advantage. Many skilful landscape men, however, prefer a weaker developer, with more acid, as more conducive to cleanness and brilliancy. Mr. Vernon Heath, for instance, whose landscapes are very remarkable for delicacy and brilliancy, employs a solution containing eight grains to the ounce of protosulphate of iron and twenty minims of glacial acetic acid. Others employ the same fifteen or twenty grain solutions which they find successful in portraiture. Here, again, much will depend on circumstances. If, from any cause, the tent or dark box do not afford accommodation for easy and perfect manipulation, a weak solution of iron with plenty of acid will allow the plate to be covered with less risk of stains than a stronger solution; but if the exposure, from containing moving figures, or other cause, is short, and the subject not well illuminated, or the weather cold, a stronger developer will bring out detail better. A little practice and observation will be the best guides.

In connection with development, another very important question arises. As the economy of water in the field is generally a point of considerable moment, it is very often desirable to develop the negative with iron, and slightly rinsing the surface, leave the intensifying, fixing, &c., to be done at home, with every facility at hand, and a calm judgment to determine the exact intensity to be obtained. This may be done in a variety of ways. A water-tight box may be employed, filled with distilled water, as recently described in our pages; or the film may be allowed to dry, and be again moistened for the purpose of intensifying. The latter plan is very apt to issue in the loss of the film, and the former affords some little risk, if the film have become loosened at all in development.

The most favourite methods consist in keeping the film moist by the employment of a coating of some hygroscopic substance. A mixture of glycerine and water in equal parts has been found to answer the purpose exceedingly well in some hands, keeping the film moist for some days, washing off readily afterwards, and permitting the proper amount of intensification to be effected without difficulty. But some uncertainty occasionally attends this method, possibly from some fault in the glycerine, and we have occasionally heard complaints of fog arising during intensification, after glycerine had been used. On the whole, perhaps, nothing is simpler and more effectual than a mixture of golden syrup and water in equal parts. This, poured over the film after it has been developed and rinsed, will preserve it effectually from dessication, is easily removed by washing afterwards, and permits satisfactory intensification to be effected, without any risk of fog, or the film leaving the plate. A somewhat singular fact in connection with this method was recently brought under our notice. If, after the removal of the golden syrup, the film be coated with a solution of iodine, as we have often recommended, to prevent risk of fogging the shadows, whilst intensifying, the plate certainly keeps clean, but it also refuses, from some cause, to intensify at all. This has been carefully verified, but is worth further testing. In using any preservative to keep the film moist, a draining box must be used, and it should also have V grooves, to prevent risk to the film. These are to be obtained of the dealers or makers, without trouble or delay, as they are usually kept in stock. The system is certainly preferable to the plan of intensifying and fixing in the tent, as it saves time, saves water, saves the carriage of intensifying and fixing solutions, and secures facility for intensifying carefully and judiciously at home, instead of hastily and uncertainly in the field.

A few hints on dry processes in the field in our next.

THE PHOTOGRAPHIC EXHIBITION.

Portraits, Examples of new Processes, &c.

Amongst the most noticeable portraits in the present exhibition are several card pictures by Mr. Falkner, a name comparatively new to photographers. The specimens are not numerous, nor, as we have said, are the pictures large; but there is a freshness of treatment, and a freedom from the conventional card portrait character, which arrest and retain attention. The photography is very good; delicate, yet forcible and solid, but it is in artistic arrangement of pose, the character of the back-ground, and general pictorial treatment that their chief excellence consists, a kind of excellence we commend especially to the attention of photographers. There is, perhaps, in the present exhibition a greater dearth of portraits than at any previous exhibition of the kind, so that the few which are good are very easily examined and remembered. One of the best examples of portraiture, and the worst examples of bad taste in mounting and framing, is a portrait of the Bishop of Columbia, by M. Silvy. The picture is solid and forcible, perhaps a little tendency towards hardness, but still a fine massive picture; but the broad grey ornamental frame and black frame are in the worst possible taste. Another example of bad taste in mounting is found in the frame with lozenge-shaped apertures containing some portraits by Mr. Hanson. It is a pity that more attention is not given to the important subject of mounting photographs. A picture may be made or marred by a very little modification in the mounting and framing. We especially commend to the attention of visitors the admirable examples of treatment, in this respect, presented by Mr. Bedford's pictures.

Another example of bad taste is to be found in the vignetting of some of Mr. Hennah's portraits. A standing figure vignetted against a white back-ground so as to just cut off the figure below the knees, and give the effect of an inverted pyramid, the base of the picture being the narrowest part. No rule of pictorial art is more simple and obvious than that which demands that the lower part of a picture shall be the broadest and heaviest, and if the figure do not furnish a base to the picture, some accessory must be added. A standing male figure with the legs close together, without anything to support the composition, has but a sorry effect, and if the feet are cut off, the picture becomes altogether top-heavy and out of balance. The photography of these portraits is excellent; but the art wants reforming altogether. Some enlarged portraits of dogs, by the same gentleman, are capital, and leave little to be desired.

Serj.-Major White exhibits some very excellent examples of portraiture; his view of the Crimean Monument at Woolwich is one of the finest things in the exhibition. Messrs. Window and Bridge have capital examples of their diamond cameos. M. Claudet exhibits a number of effective portraits. Mr. Fitt's portraits of members of the Medical Council are very interesting. Mr. Debenham has one or two good portraits. The portraits of Mr. Joubert are, as usual, very effective. Mr. Jeffrey's portraits of artists are exceedingly good. Mr. Netterville Briggs (successor to Mr. Robinson, of Leamington) has some very delicate and forcible vignetted card pictures. Some very good examples of portraiture are exhibited by Messrs. Hubbard, Melhuish, McLean and Haes, Crellin, Hutton, Lonsdale, Palmer, and others, which do not call for especial notice.

There are a few specimens of enlargement. That which will attract most attention is a head of the poet Laureate, which is, in addition to being a fine head of a great poet, one of the best specimens of untouched enlargement we have seen. Mr. Palmer exhibits some good specimens of enlargement on prepared canvas for oil painting. Mr. Harman exhibits some examples of enlargement produced both by the solar camera and from enlarged negatives. We like the latter best. Mr. Pettit exhibits some "binographs," which are enlargements. In what their peculiarity consists we do not at present know. We have heard it alleged that they are produced by means of two lenses, the image formed by one being superposed in that formed by the other; but cannot vouch for the fact. There is nothing in the pictures which suggests any peculiarity of treatment.

Amongst the coloured work we have also some enlargements. One by Mr. Lonsdale is very carefully painted; but lacks a little robustness. A picture of the same kind, exhibited by Madame Brunner, is very good; but would be improved by a little of the finish, which is present in excess, in Mr. Lonsdale's picture. Messrs. Moira and Haigh, Gush and Ferguson, and Mr. Hubbard have some excellent coloured work, as have also a few others.

Mrs. Cameron exhibits a large number of studies, the character of which we have before indicated in these pages.

As we have before said, we think the idea on which such productions are based to be altogether an erroneous one. The assumption here, is that blurred definition from movement in the model or want of focus, and slovenly manipulation, are conducive to pictorial effect. To such a view we altogether demur. Where an artist possesses a definite idea of what he wishes to represent, the more clearly his work is defined and made out, the more free from smudge and blurring, the more perfectly will his idea be rendered. If the idea be hazy or uncertain in the artist's mind, then imperfectly made out and smudgy work may *indicate the intention*, and leave a great deal to the beholder's imagination. If that imagination be lively, rare beauties may be seen in the work, as wondrous pictures may be traced by fancy in the fire. Mrs. Cameron's pictures have undeniable suggestions of feeling for art and the massing of light and shadow; some lovely models are also introduced; but we cannot help feeling that the result is much enthusiastic effort wasted. Without the delicacy of gradation, perfection of detail, and effect of finish, which are the glories of photography; without the colour and life which belong to the rough sketches of the master-hand in painting, they fill no void, supply no want, create no status for themselves, nor any permanent satisfaction or position for the producer. With the enthusiasm and real artistic feeling this lady possesses, we cannot help looking for better things, in which the art shall not be lacking, but much better expressed.

The chief examples of the results of processes consist in enamels by Joubert and Camarsac; carbon prints by Swan and Pouncy; prints by magnesium light by Mr. Brothers; photolithography by Mr. Griggs; microphotographs by Dr. Maddox; prints from rapid tannin plates by Major Russell; Eburneum prints by Mr. Burgess; and collodio-chloride prints by ourselves. Of the latter we shall not, for obvious reasons, speak here; our readers have already read the opinion and award of the committee. M. Camarsac's miniature enamels are now, as they have been for some time past, exceedingly perfect. M. Joubert's enamels are on a larger scale, and exceedingly fine, nothing can be finer than his photograph of Mr. Davis's finely-sculptured group, "Madonna and Child." Mr. Swan's examples of carbon printing are a little too deeply printed to do the process justice. Mr. Pouncy's specimens consist chiefly of some prints described as in ceramic colours for transfer to, and burning on, china. As it would be obviously unfair to judge of the ultimate quality of the pictures from the dull effect now presented by the transfers, and as there are no examples of the work when burnt in, we cannot enter into much criticism. The one or two examples in prinking-ink are not so good as some we have formerly seen by the same process. Mr. Brothers' admirable specimens of photography by magnesium light are well worthy of careful examination, both for their own sake, and as examples of the first photographs produced by this illuminating agent. The microphotographs of Dr. Maddox, exhibited by Mr. How, are well known as of the highest excellence, and thoroughly deserved their medal. The instantaneous pictures of Major Russell are interesting as the results of dry plates; but not having been produced for exhibition as specimens, they do not, of course, compare with the best instantaneous pictures from wet plates. Mr. Burgess's Eburneum prints are, as we have before described them, very charming.

Mr. Gill has a frame of very clever "doubles," amongst which are some happily conceived and cleverly executed little pictures, which show that this "trick" of the art can be put to good purpose. Mr. Haes's very interesting series of natural history studies we have already noticed. A photograph of a monogram by Mr. Wilson, of Leamington, which contains, in one continuous line, perfectly traceable through all its intricacies, all the letters of the alphabet, is well worth the attention of the curious, as a fine example, not merely of ingenuity but of admirable balance of lines. The stereoscopic interiors of Captain Halford are as perfect as anything of the kind can well be. There are some other good pictures and interesting specimens, but not such as call for especial notice.

ECHOES OF THE MONTH:

BY AN OLD PHOTOGRAPHER.

The Exhibition—Dr. Vogel's Discovery—Foreign Exhibitions—The Editor of the "Art Student"—Mr. Pouncy — North-East London Exhibition — The Societies.

It is not only pleasant, but it is quite a new sensation, or at least, one not met with for many years, when you go to an exhibition of photographs to see people looking at the pictures. The conjunction of the Photographic and Architectural Exhibitions was a wise step, and the result has been advantageous to both professions. I have been to former exhibitions of photographs, and have found them quite empty of visitors, but I have never run into the present exhibition without finding it attended by a very fair company. That the photographs are the principal attraction is evident at a glance. Another surprise was the able and exhaustive "Report of the Exhibition Committee," which, for completeness and sound judgment, has surpassed anything of the kind that has yet been issued by the council of the society.

Here is a chance for original discoverers of new dry processes! A mine of new inventions is open before them, which only want refining from the ore. Dr. Vogel has discovered the foundation on which the development of an iodized film rests, and his discovery opens up a long list of agents that might be used as preservatives and developers.

The exhibition of the French Society shows a marked falling off on those of former years; and the English photographers are not so well represented as usual. This is to be regretted, but can scarcely be wondered at by those who know how little the interests of foreign exhibitors are attended to, and how difficult they find it to obtain their specimens back again at the close of the exhibition. An exhibitor of last year, to my own knowledge, has only just been able to reclaim his pictures, and then only by getting a friend to call on the secretary, seize the pictures, and send them off himself, putting the exhibitor to the expense of a new packing case, his own having been sold or destroyed. This being the third time he has been served in a similar manner, he wisely abstained from contributing to the present exhibition. The Berlin Exhibition, on the other hand, seems to be a great success, a result which the courtesy of the managers deserves.

I, the "Old Photographer," have very innocently offended the editor of the *Art Student* by objecting to a paragraph in which he stated, in reference to the coming North-Eastern London Exhibition, that photographers had "*grown wiser* and eaten humble pie," and he has written a letter to the News at which I won't be angry, because it must be punishment enough for him to feel he has committed that which is said to be worse than a crime—a blunder; in other words he has "missed his tip." An editor, of all people, ought to know that it is scarcely fair, or consistent with the etiquette of journalism to make a wild guess at the author of any particular article in a contemporary, and run that unfortunate person down accordingly, on the "shoot at a pigeon but kill a crow" principle, I suppose. He also took the trouble to refer to another subject when he was writing, and to "vote in favour of Mr. Hughes's idea of lighting the sitter, and in opposition to the antagonistic opinion your aforesaid contributor expresses." This is very funny, seeing that Mr. Hughes and the "Old Photographer" entirely agree on the subject. The only suggestion made in the last "Echoes" was against the tendency to insipidity produced by over-softness. I can assure the Editor of the *Art Student* that I prefer soft pictures as a rule, and agree with Milton when he says—with a difference—

"How charming is divine 'Photography!'
Not harsh and crabbed, as dull fools suppose,
But musical as is Apollo's lute,
And a perpetual feast of nectared sweets,
Where no crude surfeit reigns."

Without making the faintest allusion to the second line in reference to the Editor of the *Art Student*, I might call attention to the truth of the concluding lines; a photographer who has had enough of the art is as rare as a dead donkey, or a retired post-boy.

On the memorable occasion, only last January, when Mr. Pouncy, standing before the Photographic Society of Scotland, commenced his paper by the boast "I have the honour to appear before you this evening as the inventor of photographic carbon printing," he, in a spirit worthier of the prize ring than of a photographic society, offered five pounds each for any specimens of carbon photographs, with satisfactory proofs that they were produced prior to his own. As may be seen in an article in the last number of this journal, the prints have been produced, but the money is not likely to be demanded. Mr. Pouncy's quibble will be, that the evidence is not conclusive, but it must be so to all except himself. It is to be hoped the prints will be exhibited at the next meeting of the Society, as they would definitely settle a question about which the world has not had much doubt, but upon which there has been much discussion. It is also to be desired that they will prevent, in future, Mr. Pouncy's unseemly efforts to appropriate other men's credit for his own glorification.

No application for space in the forthcoming Exhibition of Arts and Manufactures, for North-Eastern London, can be entertained after the 15th of June: therefore, all those who would do honour to themselves, and credit to the art must send in their applications for space before that date. Forms can be had of Mr. John Barnett, Hon. Secretary of the North London Photographic Association, 12, Ockendon Road, N.

There has been a lack of interest in many of the societies during the month. The end of the sessions is so near at hand that new and valuable topics seem to be exhausted or reserved. At the Photographic Society of London, Major Russell read an interesting paper "On Dry-Plate Photography," which elicited little or no discussion. At the North London Association, Mr. G. Wharton Simpson described his valuable method of printing on opal glass, mica, and other substances, illustrated with choice specimens. A variety of miscellaneous business, which is always interesting, was also transacted. Mr. Springham exhibited and explained camera stands and cameras of his own invention, which, I fear, must be considered more ingenious than generally useful. Mr. Davis, late of New Zealand, exhibited a number of tannin negatives, and prints from them. A point of much interest in these negatives was, that some of them, and those amongst the most successful, were developed with iron, showing that, although tannin and iron in combination ought to make ink, it nevertheless will produce very excellent negatives.

The chief exception to the dullness that has characterized the month's papers was Mr. Leake's paper, read at the South London meeting, entitled, "About Lighting the Sitter and Soft Pictures," which might be called a continuation or an exposition of Mr. Hughes's paper on the same subject, read at the previous meeting. Of Mr. Hughes's paper I spoke in the last "Echoes;" of Mr. Leake's I need only say that it entirely accords with my own views of the all-important subject of making the best of the sitter and letting off the victim with the least torture to himself and the greatest gratification to the photographer; the gratification produced by good work. Mr. Alfred Harman read a paper on "Artificial Light for Enlargement," and exhibited his apparatus for making oxygen, and which appeared to be the safest, as well as one of the most efficient arrangements for the purpose.

Being the conclusion of their photographic year, the Council of the Photographic Society of Scotland presented their report. This Society, now at the end of its ninth year, has much to be proud of, it has brought together, at various times, some of the finest collections of photographs that have ever been exhibited, and it was the first to initiate the practice of offering medals for the best pictures exhibited in various branches of our art, a practice which has since been followed by other exhibitions with the greatest success, and which has done much to encourage the love of true art and sound manipulation amongst photographers. Their medals have always been given with such strict impartiality to the best picture, without any reference to the expediency of rewarding any particular individual, that their award has been the most coveted of any. The medals offered for the next competition, which will take place about next December, are:—For the best view taken by a dry process—For the best view taken by an amateur by any process—For the best portrait—For the best enlargement (view or architectural subject); and—For the best enlargement of a portrait. The council reserve power to award extra medals. All the pictures must be untouched, and from single negatives, except in the case of views, which may have the sky printed from another negative, or they may be toned or shaded before fixing. This appears to be a most judicious list of awards, and calculated to improve the art in several of its weakest places, dry processes and enlargements for instance. There is a little inconsistency in allowing views to be printed from two negatives, and debar any other kind of picture the advantages which, undoubtedly, are to be gained by double printing, and if two are allowed, why not three, and so on? But this is only a spot which does not interfere with the brilliancy of the sun. All must regret that the Hon. Sec., Mr. T. B. Johnston has resigned the office he has so long and so ably filled.

The Edinburgh Photographic Society held one of the most pleasant of all photographic meetings, a dinner, early in the month, with such success that they contemplate repeating the experiment shortly. At the meeting on the 17th, Mr. Tunny read a paper "On Artificial Ivory and other Printing surfaces." This is another of those curious coincidences in photographic inventions to which I have referred in a former "Echoes." The process being nearly identical with Mr. Burgess's Eburneum process, which Mr. Tunny very fairly acknowledges. In the discussion which followed, the Chairman, Mr. Nicol, stated his belief in the now exploded error that collodion must be unstable because pyroxyline, from which it is made, has been known to decompose.

At the Manchester Photographic Society, Mr. Kershaw read a paper on "The Development of Collodio-Albumen Plates by Alkaline Pyrogallic Acid." It had the merit of being the shortest paper on alkaline development, and by far the most practicable, that has yet been read on this voluminous subject. At an extra meeting Mr. Noton prepared some collodio-albumen plates before the members. As this was the last in-door meeting of the season, would it be improper to suggest to the Society the choice of some new subject? Their constant topic—collodio-albumen—is very interesting, and has been thoroughly well worked and discussed. Will the Society do as much for some other useful subject?

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AN EASY AND CHEAP METHOD FOR REMOVING THE SILVER FROM USED DEVELOPING SOLUTION.

BY M. P. SIMONS.*

I have had in use for some time a method for the above-named purpose; and as I have found it to be very good, I will now, with your permission, give it to your readers, believing that it may be new to some of them.

I develop over a dish, and will presume that others do the same. My dish holds about four quarts. When full, I pour into it about two ounces of aqua calcis, and let it stand over night; in the morning, I pour it off, leaving the silver at the bottom. I repeat this operation until the residue takes up too much room in my dish, when I scrape it out, and lay it aside for the refiner.

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* From the *American Journal*.

To prepare aqua calcis, it is only necessary to put a lump of unslacked lime into a bottle containing water, and in a few minutes, with a little shaking, it can be used.

I think whoever tries this will find, as I have done, that more silver can be recovered than by any other method. Lime being disinfective, there are other reasons besides economy for introducing it into the dark room, especially in the summer season.

I do not pretend to say how the lime causes the silver to precipitate so effectively, it may be that it neutralizes the developing solution, and allows the iron to act with greater power; it does it, however, and I consider it important that photographers should know the fact. No one should keep a secret of this kind to himself if it is not his interest to do so. Even the most selfish of us, if we would reflect for a moment, would be anxious to make all such discoveries public, because they would see that the more silver there is saved, or rather the less there is actually destroyed, is to the advantage of the whole profession. For I believe that it is not the war alone which makes silver so much above par, but because it is becoming scarce owing to the vast quantity consumed in manufacturing nitrate of silver. Even with the greatest care, a large portion of it will be lost—not in our time to be collected together again. And it may be that some of us will live to see the day when gold will be at par, and silver at a premium! or, which will be the same to the photographer, the relative value of these metals will undergo a very considerable change.

Now, if this is something more than mere theory—if it is a fact not far in the future, is it not important that we should be very careful not to waste beyond recovery any more than is absolutely unavoidable of this precious metal.

Philadelphia, Pa., April 5th, 1865.

◆

ON POSE AND LIGHTING.

BY M. M. PETSCH AND H. VOGEL.*

It has been clearly demonstrated in our previous essays how much the lighting gives relief to the model, magnifying wrinkles as well as effacing them completely: so, also, it can modify the colour of the hair, the garments, and the physiognomical expression. An example taken from nature has shown us the effect of lighting the face in front, giving the physiognomy a dull, insipid, sleepy, aspect: lighting on the side or from above gives, on the contrary, a vigorous, and even a menacing expression, in some cases, on account of the shadows, scarcely marked in the front lighting, cutting the planes of the face with excessive relief.

What has been stated must have served to convince our readers of the very great importance of lighting in photographic portraiture; and we have particularly desired to put them on their guard against the faults and defects which, too frequently, deteriorate the quality of portraits in other respects irreproachable.

Each of these three modes of lighting—full face, top light, and side light, imparts a totally different character to the model.

Now, the photographer's task consists essentially in reproducing in his pictures the true expression and real character of the physiognomy.

How shall he attain this result? Generally, by the combination of these three modes of lighting, and making the light fall on the front, top, and side, in suitable proportions. In this case, the light which illuminates the sitter must come from an opening situated a few feet from the model, above it, on the right or the left, so that the light falls upon the head under an angle of about 45 degrees.†

This arrangement of light is the best for bringing out the relief of the model: it is also that which artists have adopted to establish the principles of the theory of shadows, and most of our great painters have employed in their portraits. In fact, it seems to respond to a natural feeling for perspective, so instinctive that many artists, who cannot account for it, place the model in the corner of their studios, where this kind of lighting is produced, or exhaust every possible combination of curtains, hangings, screens, and windows, until they finally succeed in obtaining this natural effect, and the natural appearance of truthfulness, which lighting alone can supply.

It is of this kind of lighting, from the light falling at the same time in three directions under an angle of 45 degrees, that the 4th fig. in our preceding article (page 163), presents the application, and most appropiate example of the study of luminous effects. For, we remark, that the most luminous point strikes the right side of the forehead, and that the darkest shadows, in the contrary, fall on the lower part of the left jaw. This is the lighting invariably adopted for all sitters in most operating rooms. The model is placed in a room closed on the sides and above by a wall, or by simple draperies, so that the luminous mass reaches it through the upper window, and the glazed side. But if this mode of lighting suit most faces, it does not follow that it should be stereotyped, making faces all of one type, and monotonous. This would be a much more serious objection in photography than in painting, where the artist, by means of colour, can introduce an immense variety of effects. The photographer does not possess this resource; he must substitute the effect of light for colour, and by modifying the lighting, obtain a good chiaroscuro. Now, it is the degree of incidence in the light that it is particularly important to determine.

First, we observe that light falling vertically or laterally in front, from a distance, produces the same effect as direct lighting in front. A very large luminous mass lighting the model on the side acts as a side lighting. This is a circumstance which must be guarded against in very large operating rooms: on the contrary, a very elevated mass of light furnishes effects almost similar to those of a lighting from above, as may be verified in operating in a very lofty room, so that by enlarging more or less the lights of the atelier, and placing them nearer to or farther from the model, we can obtain at pleasure the effects of the three kinds of lighting of which we have spoken, and so modify the character of the model. When, for instance, we have a hard, strongly marked face, full of wrinkles, we direct the light upon the front and bring it near, so as to give to the features that softness and harmony which nature has refused to them.

On the other hand, if the face of the model is soft, flat, and inexpressive, bring the lighting from above into play, and thus give more vigour and energy to the features. For certain thin, hollow faces, a side lighting is advantageous; it illuminates the hollows of the cheeks on the lighted side, and gives more roundness to the concave parts, while, on the opposite side, these details are lost in the shadows.

For ladies of a certain age, who often give the photographer a deal of trouble, it is advisable to employ a very soft light falling in front, which softens the wrinkles and protuberances of the face, and obliterates the disagreeable shadows formed by those parts.

We can also place the whole face in shadow, which, of course, will not be very dark, and allow only the salient parts of the face to be illuminated.

As a general rule, we enforce this principle—every cavity and protuberance which it is wished to disguise or conceal must be lighted in such manner as to project the least possible shadow, and *vice versa*.

It is clearly understood that we must not push this principle to extreme results; we must aim only at softening the defects of the original, but not go so far as to so disguise the character that the likeness is altered or lost. Here rules cease to have any precise limit in their application. It is for the artist to appreciate his opportunity, and to consult his taste and observation, and especially the rules of art and the laws of the beautiful.

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* Continued from p. 163.

† We can easily obtain this lighting in an operating room furnished with dark curtains, where, at a few feet in front of the model, we spread them in front of the upper light, and remove the others from the sides.

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COLLODIO-CHLORIDE PRINTS TRANSFERRED FROM GLASS TO PAPER.

BY J. FREW.

Among the most important improvements that have been produced in the photographic art, the collodio-chloride of silver process of printing on opal glass, promises to be one of the best means of procuring a permanent print that has been introduced, whilst its exquisite softness gives it all the fineness of a miniature on ivory; but knowing the brittleness of this substance, which the slightest accident may destroy for ever, I bethought myself of a means of transferring those beautiful prints to paper. I am happy to say that my efforts have not been fruitless. Having experimented in this direction for some time with much success, one or two specimens I have the pleasure to send for your inspection. The process by which they were produced is similar to the one I communicated to a contemporary on a method of enamelling prints. In my first experiments I used plain gelatinized paper, but since Mr. Burgess published his eburneum process I have found the addition of oxide of zinc to the gelatine solution for preparing the paper give greater richness and beauty to the finished picture. I may premise, before giving the details of the process, that the plate has to be prepared with a little wax solution in order to facilitate the removal of the collodion film, before applying the collodio-chloride for printing.

As most photographers are acquainted with the preparation of the gelatine solution, I will only give the formula I find best suited for the purpose:

Gelatine	1 ounce
Water	12 „
Oxide of zinc	2 drachms
Glycerine	1 drachm

To prepare the paper, pour the warm solution into a porcelain tray, place it in a second containing hot water, a spirit lamp may be used under to keep up the heat. Now take a sheet of plain or albumenized paper and float for a second; now examine for air bubbles: when perfectly covered, lift it out and place it, gelatine side upwards, on a flat surface to dry. This should be done in a room free from dust. Any number of sheets may be prepared and laid apart for future use: when wanted they only require to be placed in clean cold water for a second and laid on the glass plate, after the picture has been toned, fixed, and well washed. This is best done by letting one edge come in contact with the glass, and then lay it down so that the water may flow away, leaving the paper in contact with the collodion film. Now place two thicknesses of blotting paper over it, and run a paper knife over the whole, using a gentle pressure, when all air bubbles will disappear. It should next be placed on the mantelpiece, or other convenient spot in a warm room, to dry; and in an hour or two it will be ready to be stripped from the glass.

I think this process posesses many advantages; first, the print is entirely freed from that destructive but indispensable agent, hypo. Second, its removal to a more durable substance, while it possesses greater vigour and brilliancy, and retains all the softness of the opal glass.

P. S.—The print may be mounted while on the glass: take a sheet of cardboard, a little larger all round than the glass plate, which should be damped, brush over its surface and the back of the print with a weak solution of fine glue; then lay the card flat on the print and place a board over it with a weight on the top to keep it in contact. In a few hours strip from the glass.

[Mr. Frew encloses some excellent examples of the result he describes. We have been experimenting with a similar method with great success for the last few weeks; we shall have something to say on the subject shortly. Mr. Swan has also sent us fine examples of a similar method. We believe he prepares the gelatine and white pigment ready for use.—Ed. P. N.]

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PHOTOGRAPHS OF THE PYRAMIDS BY THE MAGNESIUM LIGHT.

Communications have recently been received from Professor Piazzi Smyth, stating his success in using the magnesium light for securing photographs of the interior of the Great Pyramid, notwithstanding some serious difficulties arising from the deficiency of oxygen, and an atmosphere frequently filled with dust and smoke. Mr. Mather has received the following letter from the Professor:—

Alexandria, May 10, 1865.

Dear Sir,—I have the pleasure now of giving you the earliest information by letter that I have yet given anyone of the successful taking of photographs under the Great Pyramid by aid of the light produced when burning the magnesium wire you took so much interest in supplying me with last November.

Having had many classes of scientific observations to make at the Pyramid, and little skilled assistance, I took them in regular order one after the other, and arranged for trying the magnesium photography last of all; and this is the explanation of my having been so long in giving you any account of the results, or success or non-success of the method. Perhaps, too, I put off the subject rather too long, for, being new to me, I required some apprenticeship in working it; and an unexpected opening up of more work took place during the past two weeks we were at the Pyramid, and took the very important shape of the four corner sockets on which the Pyramid had been originally founded, and which seem to be alluded to in a remarkable passage in the book of Job, and have not all four been seen by men for many centuries —being at last excavated and laid open by an enterprising professional man from the west of Scotland. Being, however, thus opened up, I could not but unpack again the astronomical instruments, though they had been prepared for the return voyage home. I make the requisite astronomical observations to prove the relation between these fiducial markings of the original and perfect Pyramid in direction and angle with the present position of the Celestial Pole.

Still, notwithstanding the time and labour thus abstracted from the magnesium photography, the powers of that brilliantly burning metal were such as to enable me to secure some very fair negatives of several features of interest in the Grand Gallery, and Queen's Chamber, as well as in the King's Chamber. In the latter, the celebrated "coffer" was photographed from a variety of positions, and with the measuring rods arranged about it in the manner proposed by Mr. Sidebottom, and every subject having been simultaneously photographed in duplicates by two cameras, the full means will be afforded, I trust, with the aid of the stereoscope, of enabling all persons now, whether travellers to the land of Egypt or not, to form a good idea of the proportions and size of that remarkable vessel. At all events, if they do now by such means get a true and satisfactory notion of it, let them thank magnesium and the wholesale manufacturers thereof.—I remain, dear sir, yours very truly, C. Piazzi Smyth.

W. Mather, Esq., Magnesium Metal Company.

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PHOTO-PLASTIGRAPHY: A NEW METHOD OF PHOTOSCULPTURE.

BY M. A. F. J. CLAUDET.

Preliminary:—Before reading my paper on Photosculpture, which the *Societé Francaise de Photographie* has kindly permitted me to communicate, I wish to explain how it has happened that I have turned my attention to the solution of a problem which appeared to have been already solved successfully by a skilful and ingenious fellow-countryman. Without this explanation, I should have the appearance in the eyes of many persons of seeking to profit by the ideas of another person, for they could say of me that if M. Willéme had not had the first idea of transferring the forms and contours of different photographic pictures to a block of clay, representing the model in all its phases, I should never have thought of obtaining such a result.

I, therefore, desire to offer the following explanation:—In November, 1863, I was introduced by a friend to the Photosculpture Company to see the result of this new invention. I was delighted with them, and offered the use of my London photographic establishment to the society, to bring out the invention in England, and I also expressed a wish to join the company for working the photosculpture process in England. A company was soon formed in London for the aquisition of the patent, and it was arranged that I should be managing director of the art department. Immediately upon finding myself interested in the success of the enterprise, I felt it to be my duty to enquire if other persons could not produce photosculpture by different means. Shortly afterwards, I announced to the society that I had conceived a different process from that of M. Willéme, and that it would be important for the general interest, to patent it ourselves, to prevent anyone employing it to our detriment. The society paid no attention to my communication. Nevertheless, I informed it, that convinced of the originality and efficacy of my method, I intended to patent it at my own cost, declaring at the same time, that if the invention was found practicable, I would resign my rights to the society upon payment of the expenses of the patent. Shortly afterwards, from causes unnecessary to explain, my connection with the society was severed; by my patent having been taken out in England as well as in France, upon my withdrawal, it naturally remained any property. Such are the circumstances that gave birth to the idea and realization of my invention.

I believe that I have given a new solution to a very interesting and difficult problem. I can produce photosculpture by a simpler process, more exact and less expensive, differing in principle and in manupulation from M. Willéme's process, founded, as we know, upon the application of the pantograph, which I make no use of. I have wished to have the satisfaction of describing my process before the society in order, if there be any merit in the invention, that I may add this discovery to the rest of my photographic works, which, as my friends know, have always had an aim more scientific and artistic than commercial.

Description of the Process.—We employ several photographs or designs. The most important are the two profiles, and the front and back of the figure; but, the more intermediate views are employed, the greater exactitude and perfection in the forms of the model we obtain.

In my process, the original photographs are enlarged, by the lens of the camera, exactly to the dimensions of the clay model, and these enlarged images are projected on the block of clay, or other plastic material, to aid the artist in forming his model, by following the contours of these images, having their exact focus upon the plane of the axis of the model.

The block of clay is placed upon a circular base, turning upon its axis. This base slides in grooves, so that it can be advanced or withdrawn, the grooves being marked with divisions, which show the distance at which the various parts of the block must be placed to be in the exact focus of the image, and to be in contact with the point intended to cut the model.

To operate, the block to be modelled is placed upon this circular base turning on its axis, and the negative photographic picture, or positive reproduction (as a guide, I prefer the negative, which, in all cases possesses the advantages of avoiding a double operation), is projected upon the block, taking care to bring successively to the focus of the photographic image, the plane of each part of the block which must correspond with the figure. Then, in following the silhouettes or profiles, the planes of which have been isolated from the other oblique or retreating parts, by means which I now attempt to describe, the artist communicates to the block the form of the photograph, by cutting the block according to the contour it bears of the photographic image. He next turns the block in the position which coincides with that of another photograph, which is placed in the camera, and he cuts the block after another profile or contour, and so on, until all the photographs have been, by turns, projected upon the block by the camera, and the block has made a complete revolution on its axis.

It is necessary to observe that the image from the camera being correct upon a plane surface only, it cannot be projected upon a solid body without being distorted, particularly upon those parts of the circumference which receive the rays of the picture most obliquely. Such parts of the block being just those which must be modelled according to the contour of the photographic view, it is essential to employ all the means capable of preventing this distortion, and the following method accomplishes this object—

It consists, in introducing into the block, exactly upon the plane which must receive the photographic contour, a thin metallic plate, upon which this contour is projected. The artist can then, by following the image, cut the clay which covers the metallic plate. This done, the plate is carefully withdrawn from the block, so as not to distort the cut outline, and then again introduced into the block upon the next plane to be modelled, and so on, with every turn of the block, until its form is completed.

I have shown how we can determine beforehand the position of the plane of the part of the picture we are about to model, by examining the view at a right angle to that at which we follow the contours. By this means we find exactly the place at which we must introduce the plate into the block. This plate may be attached to the tool at its point, and every part of the image which we wish to model is successively represented upon its surface, while the point of the tool follows the contours of the picture, and transfers them to the block. Thus, step by step, we arrive at an arrangement which forms a complete process of the greatest simplicity. Everything is reduced to the employment of a new instrument to which I give the name of *plastimonograph*, to distinguish it from M. Willéme's pantagraph, and to characterise the property it possesses of communicating relief by a single tool, which cuts the solid, and, at the same time, follows the plane lines of the design which guides it, and which it carries wherever it passes. There are other minute details to complete the operation, which it is not essential to enter into. We proceed to give the summary:—

The novelty of my invention, and that which serves to distinguish it from that of M. Willéme, consists in this that to produce a photosculpture, I do not employ the pantagraph, for I project directly upon the block, by the camera, the pictures of the original photographs enlarged to exactly the dimensions required in the model. The artist has then only to follow the contours of the image upon the block, to cut it, and communicate to it all round, the forms indicated upon the silhouette of each photograph successively projected upon the corresponding parts of the block. It is only necessary to avoid distorting the image upon the retreating contours of the block, and for that I employ a thin metallic plate, which is temporarily introduced upon each plane of the block, while the artist cuts the clay that covers it.

To render the work easier, I project, at the same time, two photographic images upon the block, which have been taken at right angles. Two cameras, placed at right angles, project these images upon the two corresponding sides of the block, and each image indicates the several planes upon which the metallic plate must be placed to receive each silhouette we intend to cut. When the same operation has been repeated upon each side of the block, the artist will have to soften the more or less rough outlines produced by the tool, to cause the asperities which separate the several cuttings to disappear, and to correct and perfect the model. For this operation, the model must be moved a little to the right or to the left of a screen, upon which the photographic picture will remain, projected by the camera, the artist having before him, one beside the other, the model and the image of the same size; he will correct the model by comparing it with the eye, or by measuring with a compass the different proportion of the original and the copy. A beam of light directed upon the model, will lighten it sufficiently, without neutralizing the image projected by the camera, and the artist will see both distinctly while at work. When he has finished one side of the block, he turns it one division, and project the following corresponding photograph upon the screen, and so on, until all the faces of the model have been corrected.

While I project the photographic image directly upon the block, I can aid myself with a new instrument, to communicate to it the contours of the photographs, and I can also perform every operation by this means alone. I have described this instrument, which I call the *plastimonograph*, to indicate its simplicity, and express its properties. For, it is one and the same tool, which on the one hand cuts the model, and on the other, bears the image that guides it. As, in the first process, it follows the contours of the image projected directly upon the block; but in place of following these contours upon the block itself, it follows them upon a plane a little in advance of the block, previously a little removed, by means of a disc it carries, and which intercepts the rays of the image, in their path towards the block. Consequently, while the instrument is put in motion to cut the block, all parts of the image, the rays of which, without this instrument, would fall upon the block, are found intercepted by the disc, and pass over its surface, where they are successfully represented. Now, if the centre of the disc be marked with a bright or a dark point, and, in making the disc move upon the plane of the immovable plane of the image, we make this point pass over the contours of the image, which come successively to be represented upon the disc during its progress, the point of the tool will follow the same movements as the black point, and communicate the lines of the photographic image to the block.—*Bulletin de la Societe, Francaise de la Photographie.*

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ON THE ACTION OF LIGHT UPON IODIDE OF SILVER.

BY M. CAREY LEA.*

IODIDE of silver formed in presence of an excess of alkaline iodide is known as the "insensitive variety," and this supposed insensitiveness has been considered as one of the well established facts in photographs.

Some investigations which I have lately made, have led me to the conclusion that this view is erroneous, and that iodide of silver, however formed, is always sensitive to light. That, consequently, the difference between the two sorts is one of degree and not of kind.

Dr. Vogel concludes from his investigations upon the action of light upon the silver haloids—investigations which constitute the most valuable additions to scientific photography that have been made for many years—that whilst the chloride and bromide of silver are reduced by the action of light into sub-chloride and sub-bromide, no such change takes place with the iodide. Pure iodide of silver, whether formed in an excess of silver salt or of iodide, exposed to light in tubes, gave off no iodine. Its splitting up into metallic silver and a super-iodide was disproved by the fact that no metallic silver could be found in the mass after exposure. Dr. Vogel's conclusion, therefore, seems to have been justified by his experiments: that the action of light upon iodide of silver is altogether physical, and entirely distinct from any chemical change.

If the action of light upon iodide of silver were chemical, and if it could be shown that chemical decomposition took place only in the case of iodine prepared in presence of an excess of silver salt, we should at once see a reason why light should not act upon that variety of silver called hitherto "insensitive." But as both varieties withstand the chemical action of light, there is no *à priori* reason why one should be sensitive and the other not so.

And this difference does not exist. Why there should be so great an inequality in the sensitiveness as there appears to exist, it is not easy to say; but that iodide of silver formed in presence of excess of alkaline iodide does exhibit a well-marked sensitiveness, and a capacity to form a latent and developable image, I can say with certainty.

I shall proceed to state the experiments, which have led me to this conclusion, briefly.

1. A piece of paper was flowed over with a solution of nitrate of silver and dried. It was then floated upon a solution of iodide of potassium, well washed, dried, and exposed under a negative, for five seconds to direct sunlight. A developer of pyrogallic acid and silver brought out a faint but distinct image.

2. Paper was flowed over with a fifty-grain solution of nitrate of silver, and dried. In experiment 1, the paper had been floated only on the bath of iodide, and it seemed possible that the iodide might not have thoroughly penetrated and decomposed the whole of the silver salt. In this experiment, therefore, the paper was entirely immersed in a twelve-grain bath of iodide of potassium, and left there four minutes. It was then well washed, and exposed wet, under a negative, for twenty seconds in sunlight, and developed with gallic acid and silver. A distinct image came out, but only in irregular spots.

3. Same precisely as the last, but developed with iron developer, and with same results.

4. Same, with an exposure of six seconds. Developed with iron and silver, nothing whatever came out. (This was an exceptional result, not depending upon the shorter exposure as will appear hereafter.)

5. The same paper was exposed under the same negative for one minute in tolerably strong diffused light. It was next moistened with silver solution and citric acid. Finally, an iron developer was applied, and a moderately strong picture was brought out.

6. A piece of the same paper was exposed to the same light under the same negative, and for the same time. It was then given a short development with iron and silver, washed, and a developer of pyrogallic acid and silver flowed over it. The result was a weak picture with the lights and shades reversed—that is, it was a paper negative, the shades corresponding to those of the glass negative. The portions which had been acted upon by light remained white, and those which had been protected from it took the silver, and formed the shades of the picture. It is not easy to account for this result. See also below.

7. A piece of the same paper was exposed under the same negative close under an argand gas burner, and was kept there fifteen minutes. An iron developer with silver brought out nothing whatever.

8. The experiment was repeated; a short development with iron was made, and followed by a pyrogallic development. Nothing resulted.

In all the foregoing experiments, except where expressly otherwise stated, the paper was exposed under the negative, wet.

The foregoing experiments, with others similar, appeared, notwithstanding an occasional exceptional insensibility, to be tolerably decisive. In reviewing them to seek out any possible source of error, it occurred to me that it might possibly be objected that the decomposition of the nitrate was not complete in the time allowed, and that there might remain exceedingly small quantities of iodide of silver present, which had continued to be in contact with free nitrate. Such a supposition seemed to me in the present case to be in the highest degree unlikely. Major Russell affirms as the result of investigations very lately made by him, that when a collodion plate is immersed in the nitrate bath, a certain proportion of the alkaline iodide or bromide escapes decomposition for a considerable time (especially in the case of bromide), and that it very often happens, that when the plate is removed from the negative bath, there remains a portion of undecomposed alkaline salt at the back of the film. Evidently, in the case of paper, this could not so easily happen, especially when the paper is wholly immersed.

In order, however, to remove all possibility of uncertainty, a fresh portion of paper was prepared with a fifty-grain solution of nitrate of silver. A bath of iodide of potassium of about fifteen grains to the ounce was fully saturated with iodide of of silver, inasmuch as the prolonged immersion which it was intended to give, would otherwise have tended to dissolve a large part of the iodide of silver formed in the paper.

The silvered paper was immersed in this bath, taking care that the quantity of the bath was largely more than sufficient to decompose all the silver salt in the paper. In this bath it was left *three hours*, a period which must remove every shadow of suspicion as to the existence of an atom of nitrate of silver in the paper. It was then washed for an hour and a half in running water, and was used for the following experiments.

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* From the *American Journal of Photography.*

9. A portion of this paper, still wet, was exposed to direct sunlight for three seconds. A solution of nitrate of silver and citric acid was poured over it, and then an iron developer was applied. A strong and distinct image was brought out.

10. Exposed seven seconds to sun, under the same negative; then dipped into the negative bath, and developed with protosulphate of iron, acetic acid, and citric acid. A visible image was obtained, but much fogged.

11. Same paper, exposed one and a quarter minutes to diffused light. An iron developer forced out with great difficulty a faint image reversed—a negative instead of a positive.

The foregoing results appear to be tolerably conclusive, but upon a careful review of the whole question, there appeared to be one possible source of error still left. Nitrate of silver forms with certain organic bodies, compounds of peculiar nature, and which strongly resist decomposition. We know that the compound thus formed with albumen resists the fixing agents commonly employed. We know, too, that nitrate of silver forms a compound also with gelatine, a substance which enters largely into the sizing of many sorts of paper. Now, it might possibly be objected that such a compound might have been formed within the paper used. We also know that the sensibility of the silver haloids is heightened, not only by the presence of free nitrate of silver, but by that of many other silver salts, insoluble as well as soluble. If, then, a compound of silver and gelatine or other organic matter were present in the paper, it might be objected that the iodide owed its sensibility to the presence of that organic salt.

Although such a supposition appeared extremely improbable, it was thought necessary to test the question by actual experiment. We know that collodion does not form a compound with nitrate of silver. Collodion seemed, therefore, a proper foundation for supporting the layer of iodide to be tested.

(*To be continued.*)

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MAGNESIUM.

BY E. FRANKLAND, ESQ., PH. D., F.R.S. &c., &c. *

The next most important considerations affecting the future of the magnesium light as a general illuminating agent, are its intensity and cost. Both the visual and chemical intensity of this light have been experimentally determined by Professors Bunsen and Roscoe, who found that a burning magnesium wire scarcely exceeding 1/100th of an inch in diameter, emitted a light equal to 74 stearine candles of 5 to the pound. Such a magnesium light costumes almost exactly 3 feet of wire per minute; so that in ten hours 1800 feet of the wire or, 2½ ounces, would be consumed. Burning for the same length of time, 74 candles would consume 20 lbs. of stearine. The same amount of light would be yielded by 16·6 lbs. of sperm candles, or by 404 cubic feet of 12-candle gas. Now, the present price of magnesium is one guinea per ounce;† therefore, taking the price of stearine candles at 1s. per pound, and that of 12-candle gas at 4s. 6d. per 1000 cubic feet, we have the following comparative cost of the same amount of light from the three sources:—

2½ oz of magnesium	...	...£2	12	6
20 lbs. of. stearin candles	...	... 1	0	0
404 cubic feet of coal gas...	...	... 0	1	9⅓

This statement of the present comparative cost of light from these sources is obviously an unfair one for the magnesium, since the latter is manufactured by a new metallurgical process the capabilities of which for economical production have as yet scarcely been ever fairly tested, whilst the inventions of more than half a century have brought the manufacture of the two other illuminating materials to a degree of perfection, which does not permit the anticipation of any such reduction of cost in their case as may be fairly expected in the price of magnesium. According to the present mode of manufacture, the cost of producing magnesium depends essentially upon the price of the reducing material—sodium, which is now sold at 10s. per lb., the actual cost of production being probably about 4s. 6d. per lb. Taking into consideration, however, the materials and processes used in the manufacture of sodium and phosphorus, it may fairly be assumed that, with an adequate demand for the former, it might be produced at the same cost as the latter, and might, consequently, be sold at a profit for 2s. 9d. per lb. Now, the smallest quantity of sodium that could be made to produce 1 lb. of magnesium is 1 lb 14⅔ oz., but in practice it would probably never be possible, even under the most favourable conditions, to obtain 1 lb. of saleable magnesium with an expenditure of less than 2½ lbs. of sodium. A quantity of the raw material, or ore of magnesium, prepared ready for reduction, and capable of yielding 1 lb. of the metal, ought not to cost more than 2s.; so that we have, as the minimum cost of the materials alone for 1 lb. of magnesium,

Ore...	... ...	2s.	0d.
2½ lbs. of sodium at 2s. 9d. per lb.	...	6	10½
		8s.	10½d.

The additional cost of fuel, labour, wear and tear, &c., is at present very difficult to estimate. but it would probably not be less than that of the materials themselves. We may, therefore, assume that with the utmost improvements in the manufacture of sodium, and of magnesium by the sodium process, and with an immense demand, the minimum market price for magnesium allowing a fair profit to the manufacturer, would be 2s. per oz. This would bring down the cost of the magnesium light, in the above comparison, to 5s. Thus, under the circumstances contemplated, this source of light, though much cheaper than candle-light, would still be nearly three times dearer than coal gas. Far different, however, would be the result if the use of sodium could be dispensed with, and the magnesium reduced from its ore, like zinc, with charcoal. Under such conditions, it would not be unreasonable to anticipate that magnesium could be manufactured and sold for 2s. 8d. per lb., which would reduce the price of the magnesium light to lest than one-fourth that of gas. Although magnesium has not yet been successfully reduced by the metallurgical process applied to zinc, yet the great similarity in the habits of the two metals already pointed out, suggests the possibility of such an inexpensive mode of reduction. In that case, we might again witness a revolution in artificial illumination as profound as that effected by the introduction of gas.

There is one consideration which highly recommends magnesium as an illuminating agent, and that is the comparatively very small amount of heat which it produces for a given illuminating effect. In this respect we have already in gas a source of light greatly superior to candles, as gas produces only about one-half the amount of heat generated by candles, yielding the same amount of light. But magnesium far transcends gas in this respect; since, with equality of light, the heating effect of magnesium is actually 265 times less than that of coal gas. In the burning of candles and coal gas a very small percentage only of the heat produced takes the form of light—hence the unpleasant heating of apartments brilliantly lighted from either of these sources. The magnesium light would almost entirely obviate this inconvenience—at all events, it would reduce the heating effect from a given amount of light to 1-265th of its present amount.

As regards the nature of the products of combustion, magnesium has some advantages over gas and candles, but they will probably by found to be more than counterbalanced by corresponding disadvantages. Gas and candles produce. on their combustion, steam and carbonic acid, these mingling with the air of the apartments in which they are consumed, soon render it unpleasantly moist, and vitiate it to a considerable extent unless proper ventilation be provided. Magnesium evolves no gas or vapour on combustion, its sole product being solid calcined magnesia; but, unfortunately, a large portion of this is thrown off as an infinitesimally fine white powder, or dust, which soon pervades the air of the room, and quickly renders it unbearable. It is not impossible that, by some suitable air-filter, the escape of this white powder from the magnesium lamp might be prevented; but, until this is effected, every magnesium light would require to be ventilated like a sun gas-burner. The promoters of the magnesium light cannot too early address themselves to the remedying of this defect.

In the above remarks, attention has only been directed to considerations affecting the employment of the magnesium light for the general purposes of illumination, and it will, at once, be perceived that several of the disadvantages under which this light at present labours, lose their force in many special applications. Thus, the consideration of economy becomes a very secondary one in its application to lighthouses and to photography; whilst that of the inconvenience of combustion falls to the ground in its application to street illumination, as well as in its use by the photographer; the latter only requires the light for the fraction of a minute on each occasion, and the amount of the innocuous magnesia diffused during so short a time is too small to produce any inconvenience. Its use for lighthouses and for night signalling demands especial attention from those interested in such matters, since this light, though much less intense than the electric light, is yet far more so than the ordinary means of illumination; whilst it is obviously applicable in many situations —on board ship, for instance—where the electric light could not possibly be employed. In photography, the only rival that magnesium has to contend with is daylight, and even the latter is excluded from the contest in the case of caves, vaults and other dark interiors. At the present moment, Professor Piazzi Smyth is engaged in photographing by this means the interiors of the chambers in the Pyramids, and many other valuable additions to our knowledge will, doubtless, result from this application of the new light.

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* Concluded from p. 246.

† This was written before the reduction in price to one-half the amount stated. This difference must be allowed for in the calculation.—Ed. P. N.

Brilliant as is the visual light from burning magnesium, its chemical or photographic brightness is still more intense; for whilst Professors Bunsen and Roscoe estimated its light, as measured by the photometer, to be only 1-525th as intense as that of the sun at noon on Nov. 13, with a clear sky, they found at the same time its chemical brightness to be no less than 1-36th that of the sun.

Thus there are several special purposes to which magnesium as an illuminating agent, can scarcely fail to be successfully applied, even with its present cost of production. Its future use for general illuminating purposes is much more problematical. It would, however, be hazardous to deny the possibility of its employment for lighting streets and public buildings, and more than equally so to predict that it will ever be used for domestic illumination.

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ON THE USE OF ANILINE COLOURS FOR COLOURING PHOTOGRAPHS.*

BY ALBERT R. LEEDS.

When Faraday was experimenting upon the liquefaction of gases, many years ago, he observed, as one of the results of compressing coal-gas, that a peculiar liquid was formed. He found, on analysis, that this fluid consisted mainly of a hydrocarbon, containing twice as much carbon as hydrogen, and accordingly gave to it the name of bicarbide of hydrogen. Subsequently, the liquid obtained by Mitscherlich, the renowned Berlin chemist, from the distillation of benzoic acid with caustic lime, was found to yield the same body, and recently this hydrocarbon, which is now well known under the name of *benzole*, was discovered in great quantity in the lightest and most volatile portion of coal-tar oil. Now, if this benzole be heated with nitric acid so strong that it gives off red fumes, a violent action ensues, and a heavy oil is thrown down to the bottom of the vessel, which has an odour like that from oil of bitter almonds. If we examine into the nature of the change which has occurred, we shall find that one of the atoms of hydrogen in the benzole has disappeared, and that its place has been filled by an atom of nitrous acid. By way of expressing in the name the nature of the above chemical reaction, the oil thus formed has been called *nitrobenzole*.

Nitrobenzole remained for years a curiosity of the laboratory, until rescued from obscurity by Bechamp, a French chemist, who found that aniline, of whose great importance in the arts every one is aware, could be manufactured, largely and cheaply, by acting on nitrobenzole with iron and acetic acid. To be sure, aniline had been known long before this discovery of Bechamp, and the exquisite violet colour which results from adding hypochlorite of lime to it had attracted much attention, but it was not until this easy way of obtaining aniline from nitrobenzole was made known, that it became possible to use the aniline colours, shortly to be described, in dyeing. Passing over the researches of Hoffman, let us briefly allude to the process by which Mr. Perkins succeeded, after great labour and expense, in obtaining aniline purple. This gentleman had been endeavouring to form quinia by artificial means, and, for this purpose, had formed a complex organic body called allyl toluidine, closely resembling quinia in its constitution. In fact, the only difference between the two bodies is, that quinia has two atoms more of water than allyl-toluidine. In order to add these two atoms of water, he mixed sulphate of allyl-toluidine with bichromate of potash, but got, instead of quinia, a nasty, dirty-looking precipitate. Disappointed in this direction, he next treated aniline, or, rather, its sulphate, with bichromate of potash, and, although, by doing so, he did not succeed, as he had hoped, in forming quinia, yet he thus obtained the *aniline purple*, which has made him so rich and famous. Many other experimenters straightway set to work in the same direction, and, by various modes of iron, bichloride of tin, &c., have succeeded in largely manu- acting upon aniline with binoxide of lead, perchloride of facturing many other exquisite colours, such as the Violine, Emeraldine, Roseine, Bleu de Paris.

Attempts have been made to use these colours on photographs; some say they fade, others hold the contrary view, and it is in order to see whether any one has any reliable method of fixing them, that I have written this article. For the benefit of photographers who have not attempted colouring their pictures, it may be well to state, that the usual method of applying the aniline colours is to dissolve them in water or alcohol, according as they may be soluble in one or the other of these two liquids, and after painting over the surface of the picture in the same manner as with ordinary water colours, to cover the painted surface with a thin film of albumen. This albumen is not so much to shut out the air, as to give a gloss, and bring out the tints. When so applied, the aniline colours dull away, and often become yellow. For this reason, their use has been pretty much abandoned. From the way in which they are applied, it would appear most probable, that their fading is due, in this case, to the actinic effect of light. But it is hard to speak with certainty about their permanency, for, when used as dyes, they vary greatly in this respect. For example, the lighter shades of crimson zephyrs fade, the darker crimson or solferino zephyr keeps its colour admirably. On the contrary, morocco dressers are of opinion that kid leather dyed in solferino fades. In dyeing the skin, they *immerse* it in a solution of solferino, fuschine, or other colour, and certainly penetrate the texture of the leather as deeply by this means as they do by simply rubbing the surface with a rag, wet with the dye, their method of applying ordinary colours. Hence, the fading of morocco tinted with solferino, cannot be attributed to the dye having penetrated less deeply, and having been sooner worn off by rubbing and use. In answer to this, it may be shown that the purple can easily be rubbed off, to a noticeable extent, from that coloured zephyr, while, at the same time, this shade of zephyr will not fade, if exposed to the light. I have noticed these extraneous facts, to show that the use of coal-tar colours in tinting photographs ought not to be abandoned without careful experiments in applying them; and I should be glad to learn, through the columns of this journal, the experience of other persons in this matter.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, 31*st May*, 1865.

At the last meeting of our Photographic Society, the annual report was read, and pronounced satisfactory. It shows a fair balance in the treasury. The *re-election* of the retiring members of the ministration also took place, much to the disgust to those who advocate "rotary elevation to officious distinction." Committees and corporations always require an infusion of new blood periodically. And whenever this wholesome rule is neglected, the business in their hands is apt to degenerate into mere routine, or falls exclusively into the hands of two or three busy spirits. Societies that do not frequently change their officers, grown old and pedantic, and this truth is so generally admitted, that we are surprised that our Photographic Society has not acted upon it hitherto. Many members came to the last election with a determination to ruffle the calm that has so long prevailed, but matters passed off very amicably, and the Society has entered upon another year of activity and usefulness, which, we may hope, will increase our admiration and respect for it.

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* From *The Philadelphia Photographer*.

Upon M. Silvy's presenting some photographs of old manuscripts and engravings, effaced by time, which he had revived with the aid of tannin, a brief discussion ensued upon the choice of the reagent. It is certain that several agents may be enlisted, but we must especially concern ourselves with the tint assumed by the parchment, in consequence of the treatment to which it is submitted, for all tints are not equally photogenic. Thus, we may very advantageously employ ferro-cyanide of potassium, or nitrate of uranium, the blue tint thereupon assumed by the revived writing will certainly be very favourable to photographic reproduction.

M. Lowe exhibited one of his prodigies in enlarging a gigantic picture upon silk, nearly seven feet square; the operations were made in gutta-percha dishes of the requisite size, or *boats*, as M. Regnault called them. M. Davanne read a report, upon the method of colouring proofs by the aid of saline solutions, proposed by General Maugin, and M. Piard. The conclusions are, that the measures proposed are not advantageous in a practical point of view. M. Davanne alluded to the works of M. Humbert de Molard, and to the proofs exhibited in 1863, by M. de Lucy, as analogous processes. M. Paul Gaillard presented a dry collodion process, which he stated to be susceptible of retaining a very great activity; at the end of six months, even the prepared plates require only 30 to 40 seconds exposure. To ensure success, however, it is necessary to adhere strictly to the formulæ given. The collodion is bromo-iodized, the sensitizing bath is aceto-nitrate of silver; the collodioned plate is coated with a solution of tannin, mixed with dextrine. The pictures are developed with pyrogallic acid. As M. Gaillard conforms to the methods of his predecessors, particulary to that of Major Russell, we must suppose that the remarkable sensitiveness he claims for his process, is due to careful manipulation.

M. Corbassiére undertook to explain the American hoax, which states that the eye of a murdered victim retains the image of the assassin fixed upon the retina. It is simply, said M. Corbassiére, a photographic reaction, which takes place among the liquids of the eye. Perhaps this explanation is as plausible and satisfactory as any other yet given.

At the recent election of a corresponding member in the section of *Astronomy* at the Academy of Sciences, Mr. Warren De la Rue obtained four votes. M. Plantamour of Geneva was however, elected, having obtained 37 votes.

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Talk in the Studio.

Brigandage and Photography.—A recent telegram states that the photographer (Mr. Moens) who remained in the hands of the brigands, headed by Giardulli, has been fortunately set at liberty by an encounter between his captors and a detachment of Carabiniers and National Guards. The brigands were completely routed, leaving three dead and five wounded, besides eight who were made prisoners, having laid down their arms. On inquiry we do not find this confirmed, the friends of Mr. Moens state that he is still in the hands of the brigands. Mr. T. C. M. Aynsley, his companion at the time, writes a long account of their capture and treatment in the *Times*. He says:—Having been informed that all the country round Salerno was free from brigands, I, with Mr. Moens and our two wives, drove from Salerno to Pœstum on Monday last, the 15th of May, to take photographs of the ruins. Having finished our business, we left Pœstum about 4·30 p.m., and had a pleasant drive for about an hour, when suddenly, about two miles the other side of Battipaglia, I saw some men with guns walking through a corn field on our right towards the road. In a few seconds more rose out of the corn, and looking back, I saw others hurrying through a field on our left. The carriage was stopped, and I and my friend were told to come down. The brigands immediately hurried off with us towards the sea, which is at no great distance from the road, leaving the carriage, with the ladies in it, untouched. We moved about woods and fields for an hour or two, the brigands breaking down the hedges to make it as easy as possible for us to get through. About sunset we sat down, and cloaks were given us to put on, and others to sit upon. When it was quite dark we moved on again, passing through irrigated lands and over small streams, the brigands being very careful of us, lest we should wet our feet. At last we came to a stream which it was impossible to cross without wading, and one of them carried us over on his back. We soon afterwards crossed the road from Salerno to Pœstum, and about 1 o'clock a.m. arrived at the banks of a stream some distance above the plain. The brigands told us to lie down among some bushes, but, on our objecting that the ground was damp, they let us lie down higher up, saying we must, however, conceal ourselves among the bushes when it was day. They collected dry roots for us to sleep upon, gave us an additional cloak to keep us warm, and one of them very tenderly and gently raised up my head, put some more dry stuff and a pockethandkerchief under it, placed another over my eyes to shade them from the moon. We had as much bread and sausage as we liked; tobacco was also offered. We now asked the brigands, as we had done before, what they could get by carrying us off, told them we were not what they supposed, "rich English milords," but poor men; that the money we had we would send them if they would let one of us go to Salerno to get it. They considered our proposal, asked what money we had with us; we took out three napoleons and some silver. The captain of the band at once gave back the silver, but kept the gold in his hand. I offered him my watch and gold chain, but he would not touch these. After a time he gave us back our napoleons. After some further details, he says:—Our case was then again discussed, and the brigands agreed to send one of us (and the lot decided that I should go) and collect some money among the English in Naples, and in a week's time I am to send a letter to say how much we can collect. I had not left the brigands more than a minute or two when, coming to the brow of the hill, I saw troops and National Guards approaching. In a few seconds I was surrounded by soldiers with, as I thought, *North* Italian countenances, calling out, "Are you an Englishman? An Englishman, an Englishman!" They seized my hand, and one cried, suiting the action to the word, "I must give you a kiss." The good fellows thought I had escaped at their approach. In a few seconds firing was commenced by the National Guard. I hurried up some rising ground, and looking round when I got to the top, the brigands calling out, "On on, or we will kill your companion." I, of course, obeyed, and on reaching Monte Corvino received an enthusiastic welcome. The inhabitants would not let me leave that night, but sent a courier to Salerno with a letter. The deputy of the town in the Italian Parliament received me into his house and took me to the *café*, where the people all crowded around me, numbers seized my hand, one or two kissed me, and many looked as if they wished to do so. My position is one of terrible responsibility, anxiety, and doubt, for the cruelties committed by the brigands upon their prisoners are sometimes horrible, and literally indescribable. They are untutored savages, without either forethought or principle, gentle and generous, or fierce and covetous, according to the whim of the moment. In Salerno a man was pointed out to us who had lost one ear in the following manner:—After his capture by the brigands, his wife, having sent a smaller sum than they asked, the brigands sent her one of his ears, with the message that if the rest of the money did not come his head would follow. The ransom demanded in our case is one impossible for us to collect." A further telegram says:—"The Englishman captured by the brigands at Battipaglia has not been liberated as was stated; neither, as far as we know, has the troop in pursuit of the band yet succeeded in discovering their retreat. The English Consul, it is said, leaves nothing undone to obtain the liberation of the prisoner, whose sad condition, as well as the novelty and gravity of the affair, greatly disturbs the English residents. They are making the most active search, and the departure of General Arnulfi for Salerno will, it is hoped, be the means of efficaciously terminating this unhappy affair." The Naples correspondent of the *Nazione*, writing from that city on the 24th inst., says:—"I heard to-day that the British Consul had been authorized by his Government to treat with the brigands, and not to let money form any obstacle to the return of his fellow countryman."

Colouring Photographs at the Back.—Various methods of rendering photographs transparent, and colouring them at the back, have, from time to time, been published in this country; but, notwithstanding the facility with which the work can be done by non-professional colourists, have come but little into use, probably from the want of facilities for personal tuition. Mr. Theodore Scholtyssek, a German gentleman, called upon us a few days ago with some very good examples of this kind of work, by a process so simple that the least practised hand may readily acquire it, and which Mr. Scholtyssek is anxious to teach for so moderate a consideration as to render the matter well worthy of the attention of many portraitists.

To Correspondents.

Alpha.—We cannot state with certainty Major Russell's recent modifications in the tannin process with more detail or exactness than his paper gives them; but will answer your questions with as much exactitude as we can. 1. The collodion is bromized only, bromide of cadmium alone being used if the collodion do not set well, some bromide of ammonium being added if the film set too rapidly. The proper proportion of bromide will depend on the nature of the cotton, and must be ascertained by experiment. Begin by trying 4 grains of soluble cotton, and 10 grains of bromide. 2. A 60-grain bath containing nitric acid. 3. Wash thoroughly. 4. Apply tannin, allow to soak 5 or 10 minutes, and then to secure the highest sensitiveness, wash off. 5. After exposure, develop with pyrogallic acid and ammonia, containing, we believe, a little bromide. 6. When the detail is out, and no trace of fog present, add a stronger solution of ammonia to the developer, in order to get intensity, with a sufficient amount of a soluble bromide to prevent fog. To succeed in obtaining pictures, a certain amount of preliminary experiment will probably be necessary, as it appears, from the statements of the author, that no definite formula for unvarying application can be given. Major Russell considers that his paper contains sufficient detail to those already familiar with the bromide process as described in his book to work satisfactorily; but he informs us that an appendix to his work will shortly be published, supplying still further information. 7. Regarding the lenses, we shall probably say something about them after trial, but our data is at present insufficient to justify a comparative opinion. If you send us a print with the lens you possess, stating size of stop, &c., we can judge better. It ought to cover the size of plate mentioned properly with a moderately small stop.

A London Amateur.—It is difficult to assign the cause of the streaks with exactness from merely seeing a print. They might, so far as the appearance of the print suggests arise either from alkalinity of the negative bath, or from the collodion being over-iodized. Is the film perfectly even and clear before immersion in the nitrate bath? Is it even and homogeneous after exciting? Do the marks come at once on applying the developer, or gradually. We have seen something like them before; but not often. You will find it a useful thing in the very hot weather to keep the nitrate bath in an outer vessel of hot water.

Amateur X.—The "front of a negative" is, of course, the film side. 2. We know nothing of the matter beyond what is stated in the advertisement, but have no reason to believe that it is a mistake. 3. As you will perceive, you can procure as small a quantity as a quarter of a pint.

A. B. Amateur.—The negative is not sharp, and is lighted chiefly with top-front light, which makes it flat and unsatisfactory. To get black tones, you must print much deeper. Use more side light and less front light, get a little more intensity or contrast, print deeper, and tone longer, if you wish for more brilliancy.

A. Gray.—It is very probable that the pinholes are due to iodide of silver, which begins to be much more troublesome in hot weather than in cold, as you will see on perusing Dr. Vogel's articles on the subject in our last volume. Dilute, warm, and filter your bath, then strengthen, and in working it, take care to keep it cool. 2. Dry-plate negatives vary in their characteristics, but they rarely are just like iron negatives by the wet process. In many cases the image is more completely in the film, and presents less of a positive character; the colour is generally more non-actinic than that of wet iron negatives. 3. Some of the collodio-chloride prints we sent to the Photographic Exhibition were toned with gold and sulphocyanide of ammonium, and fixed with the latter, and some were toned with gold and lime, and fixed with hypo. We prefer the colour of the latter, as a rule. Although very fine tones can, at times, be obtained with the sulpho-cyanide, there is a greater danger of blueness.

P. W.—The tendency of the prints to curl, under some conditions, is very troublesome. It arises from the use of a thick, contractile collodion on a paper not quite thick enough to carry it. We know of no cure except the use of a thicker paper or a more powdery collodion. We have met with the difficulty occasionally, and have, at times, found that placing the prints, face downwards, in the solution, would keep them flat; and we have, at times, found it necessary to place something in the corners, to keep them flat; but when we have found this once, we have remedied the evil by diluting the collodion with a little alcohol, containing a proper proportion of silver, then adding, if necessary, a little more chloride solution; and we have taken care, when using a contractile collodion, to use thick paper. The prints enclosed are easily made to lie flat by rolling the reverse way, and will be all right when mounted. You do not state the history of the toning, &c. The prints have good qualities, but they are too red, a tone often obtained by long immersion in sulphocyanide and gold solution.

Nemo.—We cannot decide any special dry process to be, without qualification, the best. What do you mean by "best?" Do you mean most simple and easy to work, or most certain, or most rapid, or giving the best results? The best results we have seen by a dry process are those of Mr. Mudd, by the collodio-albumen process, and we consider that process most certain; but it involves the most trouble in preparation. The Fothergill process is less trouble, and in some hands gives very fine results. Tannin, tannin and malt, malt alone, gelatine, &c., all give good results in some hands. The tannin process, as described by Mr. Hughes is, perhaps, more simple than any, and the plates will keep a few weeks before and after exposure. 2. By "ordinary bath" is meant the bath in use for the wet process, neutral or slightly acid, with either acetic or nitric acid. There is no advantage in placing the toned print in salt and water before fixing, as any free nitrate it contained will have been converted into a chloride in the toning bath.

A. M. Y.—We cannot give you a better plan for development printing by the solar camera than that by Mr. Woodbury in our last Year-Book. The rough, granular effect of which you speak is probably due to the coarse texture of the paper, and the blackening, either to having white light in the room, or to want of acetic acid in the developer. 2. "Newman's Harmonious Colouring applied to Photographs." 3. The Wothlytype print you enclose is decidedly good.

Preserving Plates Moist.—The signature to the letter on this subject on p. 238 should have been "J. Shivas," not "J. Shwas."

R. Fletcher.—The matter has received due attention, we believe from our publisher. The view, which has been handed to us, is very excellent; it only requires the sky to be toned down a little with a graduated tint, lighter towards the horizon, to be very good indeed.

A. T. Delboy (The Hague).—Your Hermagi's powerful lens, which worked well, and gave sharp results until recently, could not have ceased to do so unless it had been rearranged in some way. Probably it has been unscrewed, and the parts put together in wrong relation. As we do not know the construction, we cannot with certainty instruct you how to ascertain this. In the usual construction of portrait lenses the arrangement is as follows:—The front lens is placed convex side outwards; in the back lens the double convex is dropped into the cell first, resting on its least convex side, then put in the ring, then drop in the other lens, concave side down, fix them in, and screw the whole together, close up. Should you still feel any difficulty, consult the maker.

Photo.—Alkalinity of the bath, or fuming with ammonia, will sometimes cause paper to become discoloured, if it be not used soon after preparation. Sometimes the quality of the paper will aid in bringing this about. The paper should always be used as early after exciting as possible, especially in hot weather. The spots are from particles of metal in the paper. The negative is over-intensified.

One in a Fix.—You do not seem to be aware that your negative is not fixed properly, the yellow iodide of silver remaining in it gives it the veiled effect. The negative is not sharp, and being taken in the open air, the figure is too much surrounded by a general flood of light, instead of being duly modelled by means of light and shadow. It is full of pinholes, which, however, seem chiefly to arise from the abrasion of the surface in carriage. Let us know if any of them were there before. There does not appear to be any fault in the materials, which careful manipulation will not get over.

D. S. S.—In speaking of using two ounces of hypo in a pint of water, we were referring to the fixing bath for collodio-chloride prints. We use double that quantity for albumenized paper. 2. A single lens generally gives, for landscapes, more evenness of definition and lighting all over the plate, and more depth of definition than a portrait lens used for the same work. 3. The chief fault of your lens arises from the fact that it is of too short a focus for card portraits, and does not cover the plate properly; hence it is that your busts are better than full-length figures. The lighting in your vignetted head is very good. The colour of a background will not affect the relief in your pictures, except so far as it comes out light or dark. Yours might be a little lighter with advantage, and the figure placed rather further from it.

Studio.—Your glass room is not long enough for successful card pictures. If you use a lens of sufficiently long focus you will require 18 or 20 feet between sitter and camera. The room should be 24 or 26 feet long. The mode of lighting and general plan are excellent. With a longer room, more glass will be desirable.

S. S. Crewdon.—The work generally is good; the chief fault is a little tendency to over-intensify, and thus make your lights chalky, and lose delicate detail in the lights. A little care in avoiding this will be an improvement.

G. Restall.—Received, and shall have attention in our next.

Several correspondents in our next.

Photographs Registered during the Past Week.

Messrs. Nelson and Marshall, 11, Upper Sackville Street, Dublin,
Photograph entitled "Donnybrook Fair."
Mr. Robert K. Fletcher, Fordham, Cambridgeshire,
Photograph of Fordham Church.
Mr. J. F. Sharpin, Scarboro',
Two Photographs of "Ye Antient Spurs of Rippon."
Mr. John Pusey, Coolhurst, Horsham,
Photograph from Drawing by T. S. Cooper.
Mr. Boak, Great Driffield,
Portrait of Miss Bemrose.
Mr. J. Wright, Hull,
Design for Trade Mark and Label.

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HINTS ON PHOTOGRAPHY IN THE FIELD.

Cameras, &c.—Various Dry Processes—Manipulations.

The dry-plate photographer's great triumph over those of the wet persuasion, consists in the compactness and lightness of his field equipment, which, except for very large plates, permits him to roam at his ease, independent of aid from friend or servant. If, however, he work large plates, or even moderate sizes, say ten by eight, if he mean to take home a dozen negatives, assistance will generally be necessary, especially if the pictures are spread over a few miles of rugged country. With the now favourite cabinet pictures of about seven and a half by five inches, a folding camera, and six plates in three double backs, packed in a leather box —we are describing our own favourite equipment—a good many miles may be traversed without very serious fatigue.

The form of camera is very much a matter of taste. Some persons prefer a rigid camera with facilities for packing the double backs inside. Some persons prefer a changing box to double backs. We prefer a folding camera, and double backs, as involving very little complication, and being easy both to pack and use. A stand without joints is the most convenient for use, but it is sometimes awkward to carry, especially in a railway carriage. Messrs. Murray and Heath recently called our attention to a capital stand, with a folding triangle head, permitting the stand to be folded up with the head attached, and erected in a moment for use. This was made of stout bamboo canes, for lightness. Perhaps, however, as a rule, nothing is better than a piece of stout ash.

The primary question, however, with the intending landscape photographer who has determined to use dry plates, is as to the mode of preparing them. What process shall he use? The answer to this question depends rather on the amount of experience the querist has gained than on anything else. If he have already mastered any dry process, so as to produce negatives with moderate certainty by it, let him for his field operations, in which he hopes to secure pictures, adhere to the process he has mastered. It is folly to try experimental processes when the object is to get pictures, especially if skill in any process have been obtained whereby approximate certainty can be obtained. But in the event of non-familiarity with any dry process, and the student having to commence his dry-plate studies *ab initio*, we may offer a few suggestions which may guide him in his selection.

There are some eight or ten distinct processes in use at the present day, all more or less related, perhaps, but still distinct in the materials employed, and more or less so in the mode of working; with all of which we have seen good negatives produced, and with the greater part of which we have ourselves experimented successfully. We pass by as out of use now, except for special purposes, the various preservative processes, in which syrups, &c., are employed to keep the film moist for a day or two, and confine our remarks to the dry processes proper. Those to which we refer are the collodio-albumen process, the Fothergill process, the gelatine process, the malt and the beer processes, the resin process, the plain washed collodion process, the morphine process, the alkaline gelatine process, the tannin process, and its modifications. Each of the processes has, indeed, some modifications or combinations between itself and other processes, a result which naturally follows, where an experimentalist, trying several methods, finds in different of them good qualities which he desires to unite in one.

The collodio-albumen process is the oldest of the dry processes, and notwithstanding the multiplied experiments in the dry processes which have been undertaken by many able hands, it still continues, in many respects, if not the best, at least equal to any other. Nothing can exceed the beauty of the results obtained, and with ordinary care very great certainty may be obtained, but the process involves more operations in preparing the plates than any other.

The operations are, first, the preparation of the plate with a bromo-iodized collodion, exciting in an ordinary nitrate bath, washing thoroughly, immersing in a solution of iodide of potassium, rinsing, coating with bromo-iodized albumen, and then drying. This is the first stage of preparing the plate, which, when it has passed through these operations, is insensitive to light, and may be kept many months ready for future steps. To render the plate sensitive, it must be first made hot before a bright fire, and then immersed in a bath of aceto-nitrate of silver, or as, in the practice of some, in an ordinary bath of nitrate of silver, washed thoroughly, and dried. It is then sensitive to light, and may be kept so for a few weeks. The exposure for such plates has frequently been stated as about six times the time necessary for wet collodion. We have found it as a rule wiser to give ten or twelve times as long. The process admits, however, of much latitude in this respect, as by management in development very good pictures may at times be produced with very short exposures. In all cases it is best to bring out the detail by means of a solution of pyrogallic acid without either silver or any restraining acid, and then intensify in the usual manner; if the plate have received short exposure, the aid of heat may be employed, using the plain pyrogallic acid solution hot until the detail is out, and if this fail, we have frequently found that the application of a two-grain solution of carbonate of ammonia has brought out a detailed image which it seemed otherwise impossible to develop. Both the heat and the alkali should be applied before any free nitrate of silver have been added to the developer. The plate should then be thoroughly washed, and a solution of pyro, with acetic or citric acid, poured over the plate before adding any silver, as if any trace of alkali be present, or if the plate be hot when the silver is applied, there is great danger of fog; and although with collodio-albumen plates the fog may be rubbed off as fast as it appears with a piece of cotton wool, still it is better to avoid the risk of producing it, as we have had cases of fog from the causes indicated, which it was difficult to remove by rubbing.

The Fothergill process, at one time a great favorite, is really a modification of the collodio-albumen, in which the plate, instead of being rendered insensitive by means of iodide of potassium, and re-dipped in the nitrate bath to render it sensitive when required for use, is coated with albumen, subsequently washed, and dried, and is in this state sensitive. It is thus much simpler in manipulation than the former, and is about the same in sensitiveness; but is scarcely so universally certain. It is much more dependent upon the quality of the collodion than the collodio-albumen process; and although in the hands of some it is very successful, it is a process about which we hear more complaints of uncertainty than almost any other. We have adopted the same methods of development with it as with that just described, but with more risk of failure when energetic aids to development were necessary.

An excellent aid to cleanliness, and we believe also to keeping qualities applicable to both these processes, consists in the application of a final wash of a four-grain solution of gallic acid, first proposed, we believe, by Major Russell. Plates so treated yield negatives of great cleanness and brilliancy.

Plain washed collodion, resinized collodion, plates prepared with malt or beer, plates by the morphine process, or by the alkaline gelatine process, are all considerably more sensitive than the albumen processes; but they have not been so extensively worked as to render the conditions of success certain. From the simplicity of preparation and the sensitiveness of plates prepared by these processes, they are well worthy of experiment by the young landscape photographer, who is in search of a process, and is willing to make some trials before he decides. The gelatine processes are tolerably safe, but they are not rapid, and are now but very little practised.

Perhaps for the young photographer who is desirous of getting at a tolerable amount of certainty, by simple means and without much experiment, there is no process which will meet his wants better than the tannin process in its primitive simplicity, using it very nearly as Major Russell first published it. The admirably clear description by Mr. Hughes of his method of working this process, employing everything just as it was in good condition for wet plates, is just suited to the wants of the non-experimental photographer, as a plain straightforward course is described with materials always at hand. The manipulations are exceedingly simple, and the results, with anything like adequate care, tolerably certain. In our own experiments with the tannin process we have obtained the most rapid and good results by the addition of a little honey to the tannin; but where keeping qualities are required this does not seem to be an advantage. As to exposure generally, we should recommend with ordinary tannin plates at least ten or twelve times the exposure necessary for wet plates and iron development.

For the photographer who is willing, in order to secure the highest results, to give some time to experiment, so as to master the conditions of success, perhaps there is no field in dry-plate photography than the rapid process on the bromized plates of Major Russell. Many photographers are attracted by the promise of this process, but seem alarmed at the absence of definitely stated formulæ, &c. To the photographer who is simply anxious to get at results, and has but little interest in the matter as a scientific process, we can understand that the admitted fact that success depends much upon the exercise of judgment, derived from experience, will be a barrier to entering upon such a process. But let it be remembered that it is but a sorry knowledge of any process which consists in the mechanical working out of formulæ, and adopting a set of manipulations learned by rote. To those willing to make the necessary experiments, and acquire an intelligent mastery of the process, a far higher satisfaction and more constant results are attainable. Major Russell has ascertained and made known the general conditions of success, and has verified his statements by practical illustrations sufficient to afford a guarantee of success to the intelligent photographer who carefully follows the indicated path. We cannot here enter into detailed advice as to proportions, &c., but we may remark that certain points seem to be definitely decided. The collodion must be bromized, and as the intensity of the negative depends not upon the reduction of free nitrate of silver added to the developer, but on the bromide of silver present in the film, it is clear that it must contain a good body. From ten to fifteen grains of bromide of cadmium may be used, a portion of bromide of ammonium being substituted if the physical quality of the collodion render it necessary.

A sixty-grain nitrate bath acid with nitric acid is to be used, and it has been ascertained that the presence of unchanged soluble bromide is necessary to prevent fog; the presence of this may be secured either by removing the plate before all the bromide is converted into bromide of silver, or added afterwards; but this is ascertained, that it is necessary to prevent fog. That carbonate of ammonia is the best alkaline agent for adding to the pyrogallic developer seems to be also ascertained. In short, all the materials to be employed, their operation, and the result of excess or of deficiency is tolerably clearly laid down: the exact proportions alone remain undetermined, and that chiefly because the varying qualities of such indefinite materials as pyroxyline render it difficult to state an unvarying formula. It is clear, however, that a little intelligent practice is all that is necessary to secure certainty in this direction.

We will conclude these hints by a few suggestions for general application in dry-plate photography. Always use new glasses of good patent plate, carefully cleaned, and roughed at the edges. For most of the dry processes use a powdery collodion containing a full share of bromide. A formula we have found answer well is as follows:—Powdery pyroxyline, 5 grains; ether and alcohol, mixed in equal parts, 1 ounce; iodide of ammonium, 2 grains; iodide of cadmium, 2½ grains; bromide of cadmium, 1½ grains. Always employ distilled water for the first wash after leaving the nitrate bath, and for the last before drying. Always give a full exposure. Always develop first with plain pyrogallic acid, and never intensify too much, as the colour of most dry plates is very non-actinic. Always try a plate of each batch before taking them into the field, to ascertain that they work satisfactorily, and form an idea of the exposure required. Always keep dry plates free from damp as well as from light. Never delay development longer than necessary. Remember that the careless or imperfect performance of any one step in the preparation of dry plates may spoil all the rest; therefore, use every care in every stage of the operations.

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MR. RUSKIN AND PHOTOGRAPHY.

It has been so long the custom of fifth-rate artists—we mean painters—and smatterers in art-criticism to decry photography as a soulless and mechanical thing, that it has long since ceased to excite much wonder or emotion of any kind amongst photographers. There are those associated with the art who know that photography is not the mechanical thing those sciolists assert it to be; they know that when they see a picture in nature their art will produce a transcript of it; they know, further, that when they have conceived a picture, they can, within given limits, give embodiment to it by the skilful employment of the appliances of photography; and with this knowledge the photographer who is an artist, or the artist who is a photographer, can afford to smile at the silly terms in which his art is at times decried.

When, however, this kind of ignorant flouting of photography comes from one of the ablest, most eloquent, and generally most thoughtful writers on art which this or any century has produced, every one must pause as he reads, and ask, Are these things so? And when he arrives at the conclusion that the very terms in which the slight is couched prove it to be one of those thoughtless and ignorant taunts in which the common herd of all ill-informed art critics occasionally indulge, the passage is passed by in sorrow rather than derision. It is with feelings of this kind we note some recent remarks by Mr. Ruskin in a series of papers, entitled "The Cestus of Aglaia," now appearing in the *Art Journal*. In referring to the decline of line engraving, and the possibility of that art being superseded by photography, Mr. Ruskin makes the following extraordinary remarks:—

> By the way, my friends of the field of steel, you need fear nothing of the kind. What there is of mechanical in your work, of habitual and thoughtless, of vulgar or servile, for that, indeed, the time has come—the sun will burn it up for you very ruthlessly; but what there is of human liberty and of sanguine life, in finger and fancy, is kindred of the sun, and quite inextinguishable by him. He is the very last of divinities who would wish to extinguish it. With his red right hand, though full of lightning coruscation, he will faithfully and tenderly clasp yours, warm-blooded. You will see the vermilion in the flesh shadows all the clearer, but your hand will not be withered.
>
> I tell you (dogmatically, if you like to call it so, knowing it well), a square inch of man's engraving is worth all the photographs that ever were dipped in acid (or left half-washed afterwards, which is saying much); only it must be man's engraving, not machine's engraving. You have founded a school on patience and labour only; that school must soon be extinct. You will have to found one on thought, which is Phœnician in immortality, and fears no fire. Believe me, photography can do against line engraving just what Madame Tussaud's wax works can do against sculpture; that, and no more. You are too timid in this matter; you are like Isaac in that picture of Mr. Schnorr's in the last number of this journal, and, with Teutonically metaphysical precaution, shade your eyes from the sun with your back to it. Take courage; turn your eyes to it in an aquiline manner; put more sunshine on your steel and less burr, and leave the photographers to their Phœbus of magnesium wire.

We wonder can Mr. Ruskin tell us *why* a "square inch of man's engraving is worth all the photographs that ever were dipped in acid (or left half washed afterwards, which is saying much")? What constitutes the excessive worthiness of man's engraving over man's photographing? Engraving is a noble art, and has worthily reproduced in monochrome many glorious paintings. Photography, in this respect, however, scarcely comes second to engraving, and there are able judges of art who accord it no second place in this matter; whilst in the matter of original work, photography is probably—always in its own groove, be it understood—a more valuable form of art than engraving. If Mr. Ruskin had really known and thought of what he was writing with an air of such technical knowledge, he would have known that photographs are not "dipped in acid;" and as the engraving is only worth all that are dipped into acid, and none are, the comparison is not a very extensive one. The slighting comparison between wax-work and sculpture as illustrating the relation between photography and engraving, little as it is to the purpose, does not, after all, imply much, as we know some of the ablest living sculptors, who have not disdained to exercise their skill in modelling for Madame Tussaud, and their works were only less worthy from being in wax instead of marble. Between the photograph and the engraving no such difference exists; each is a work of human skill on the same material, and similar in result, although different in method of production. It is unnecessary for us to decry the engraving (the art of producing which we hope will not decline), in order to maintain the position of the photograph. We need not either enter into elaborate argument to prove the fallacy of Mr. Ruskin's thoughtless taunt, nor even quote him against himself, which it would be very easy to do. Photography cannot be sneered down; and it only behoves every one concerned in the credit of the art, and its claims as an art, to maintain the position by worthy productions, so as to prove by conscientious work how true and how beautiful photographs may be.

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THE MAGNESIUM AND OTHER ARTIFICIAL LIGHTS.

Having been recently making experiments with the magnesium light, I was led, in reasoning upon the results, to conjecture that it would possibly communicate its own remarkable photogenic power to the light of ordinary flames. Accordingly, after focussing the flame of a candle in my portrait camera, I introduced a bromo-iodized plate, prepared with Messrs. Horne and Thornthwaite's negative collodion, and, just before removing the cap, ignited, at about four feet from the candle, a very small slip of magnesium riband. Immediately the flame assumed a peculiar lurid, reddish hue, its own light being apparently extinguished partially by the more intense light of the burning metal.

The plate was thus exposed about two seconds, and, upon developing with rather a strong solution of photosulphate of iron, gave a well-defined negative of the candle-flame, the outer luminous cone being perfectly distinguishable from the inner and non-luminous. Indeed, a more faithful or beautiful illustration of the constitution of flame cannot be afforded than a photograph thus produced. I next focussed the flame of an ordinary gas-burner, and, as in the case of the candle, found that its image was almost instantly and strongly impressed upon the sensitive plate, at the distance of four feet, by the light of a minute piece of magnesium riband or wire, inflamed at the same or double that distance from the luminous jet. A print taken from this negative I have the pleasure to enclose, by which you will judge how great is the actinic energy imparted to the flame of coal-gas by burning magnesium. And my experiments justify me in stating, that not only the flame of tallow, wax, and light carburetted hydrogen, or coal-gas, may be endowed with this extraordinary chemical power by the action of the magnesium light, but that *all* flames rich in carbon, or which, in other words, are the most luminous, may be thus rendered highly photogenic.

Those flames, on the contrary, which are poor in carbon, and which therefore give but comparatively little light, are with difficulty impressed upon the collodion plate when they are under the influence of the magnesium light; the flame of a common spirit-lamp, or of sulphuric ether, for instance, requiring eight or ten seconds' exposure, and furnishing only a very faint negative.

It appears, then, that the chemical rays emanating from the burning magnesium are reflected, as it were, by the solid particles of carbon suspended in ordinary flames, and in proportion, we may also presume, to the number of such particles. This supposition is, too, supported by the fact that even the *smoke* of a partially extinguished candle may be likewise readily photographed by throwing the magnesium light upon it, the image of the ascending vapour being hardly distinguishable from that of the burning candle flame itself.

It is, however, very remarkable that in the case of the candle exposed for a second or two to the magnesium light, not the least trace of the body of it, though formed of very white tallow or wax, was visible in the photograph; the flame itself and the burning end of the wick being alone impressed upon the collodion plate. And so in the instance of the gas jet, the flame only, and no part of the delivering tube or branch, having impressed itself upon the plate, under a like almost instantaneous exposure to the magnesium light.

A priori, it could certainly not have been conceived that the comparatively *dark* vapour within an ordinary flame would act so powerfully upon a sensitive plate when under the influence of the burning metal, whereas the white, strongly-reflecting surface of the candle failed, as I have intimated, to leave the least trace of an image after such brief exposure.

These experiments give rise to several very interesting questions relating to the nature of flame, and especially to the enquiry, upon what does the intense chemical or photogenic power of the light of magnesium depend? Is it simply the result of the direct combination of the metal with the oxygen of the air, light, heat, and chemical force being evolved simultaneously with the formation of the oxide? Or is this actinic influence derived, like the luminosity itself, from the solid particles of the oxide included in the magnesium flame?

I think, myself, that the latter may be, partly at least, the case; for I have discovered, upon placing a very short piece of magnesium wire within the flame of a candle or gas-jet, so as to allow a minute bead of magnesia to form at the end of the wire in the exterior or oxidizing cone; that this flame instantly acquires strong photogenic energy; and that it retains that power as long as any of the incandescent oxide is visible within it. Indeed, a photograph of a candle-flame may be readily obtained even half-an-hour after the introduction of the wire if the candle be burning slowly.

We may, then, I think, venture, as I have just hinted, to infer that the mere passage of the oxide into the magnesium flame, independently of the combination of the metal itself with the oxygen of the air, is sufficient to confer photogenic power upon it.

The practical application of these facts to photography is so obvious as not to require me to dwell upon it in the present communication, which has already, I fear, trespassed upon your valuable pages; for, if we can thus readily impart to ordinary flames the actinic property belonging to burning magnesium, it will, I hope, be found easy, by a suitable arrangement of such flames, or with the aid of appropriate reflectors or condensers, to take portraits and photographs generally by night, without the difficulties which now attend the operation in consequence of the fickle, dazzling, and unmanageable character of the magnesium light itself when directly employed.

I shall be gratified if the above imperfectly described facts should, on account of their novelty, prove interesting to your numerous scientific readers. W. H. OTLEY.

ON THE ACTION OF LIGHT UPON IODIDE OF SILVER.

BY M. CAREY LEA.[*]

THE first attempt was made by coating a glass with plain collodion, and immersing it in the negative nitrate bath. It was then drained and placed in the bath of iodide. Very little nitrate seemed to have entered the film, and the plate was rejected without exposure. To obviate this difficulty, a collodion was prepared containing nitrate of silver. With this the plate was coated, and was then immersed in a bath of iodide of potassium already saturated with iodide of silver. Considerable difficulty was experienced in getting a tolerably smooth plate in this way, the tendency to irregularity seeming to be very much greater than when the iodide is in the film and the silver in the bath.

To insure the perfect decomposition of every trace of nitrate, and leave no opening for cavil, the plate was left nearly three hours in this iodide bath, with occasional agitation. It was then thoroughly washed and dried.

Experiments made with films prepared in this way showed that the sensitiveness was the same as where paper was employed. As far as could be observed, there was no difference in the impressibility of the film. About the same exposure was employed (three seconds in the sun under a strong negative seemed to give the best results), and the same mode of development, and with similar results. The image was sufficiently strong to admit of the plates being fixed with hyposulphite of soda, without injury to them.

The iodide of silver showed some tendency to wash from the film, when the plate was placed in the iodide bath, probably because too much silver salt had been added to the collodion. This iodide was sometimes abundant enough to form a continuous film on the top of the collodion. This external layer was then entirely free from the presence of anything like organic matter, more so than, perhaps, could have been brought about intentionally in any other way.

It, therefore, became especially interesting to observe how this exterior layer would conduct itself to light. It was found to receive the latent image at least as easily as the portion enclosed in the film, to which it adhered mechanically sufficiently well to permit of developing, and even to some extent, of fixing. But when an attempt was made to wash, after fixing, in a current of water, nearly the whole of the layer and the image disappeared.

Here, I think, we have an absolute demonstration that iodide of silver, quite free from organic matter, and formed in presence of excess of alkaline iodide, is capable of taking the latent image. The experiment as here last described, seems to leave no loophole whatever for doubt. Iodide of silver, itself formed in presence of excess of alkaline iodide loosely lying upon a surface, and left for hours in presence of excess of that iodide, is, when thoroughly washed, capable of receiving a latent image which develops with considerable strength, and might, doubtless, exhibit much more vigour, if all the needful conditions were carefully studied, as they have been in the case of the usual method.

Another and a final experiment remains to be recorded which possesses a particular interest in a theoretical point of view. In fact the sole interest attached to the whole of the foregoing is necessarily theoretical. The images obtained are wholly inferior to those got with the ordinary method, and are apt to be rather foggy: the development must be carried to the verge of fogging, to bring them out. Generally, it is advisable to add citric acid to the iron developer, though this is not always necessary.

In the experiment which I am about to describe, a piece of paper imbued with a fifty-grain solution of nitrate of silver, dried, and plunged into a bath of iodide of potassium for a brief space, and then simply blotted off with bibulous paper, and exposed while still moist with the iodide solution, under the same negative, for the same time, and developed in the same manner. This paper proved to be absolutely insensible. No trace of darkening could be perceived.

What are we to conclude from this? Is it then possible for iodide of silver to be insensible?

Vogel has pointed out that if a plate of ordinary very sensitive iodide is exposed to light, and receives an image, and is then washed over with solution of alkaline iodide, the physical condition of the iodide is altered, and the *capacity for development* of the image destroyed.

If, then, iodide of silver is capable of destroying the capacity for development, when applied after exposure, we have no difficulty in understanding why its presence, in the free state, in contact with the iodide, must prevent the formation of any latent image.

Many controversies have taken place, and much argument has been employed in endeavouring to account for the alleged insensibility of iodide of silver, when formed in the presence of excess of alkaline iodide, and it has been insisted that this insensibility depended upon the retention of a minute portion of alkaline iodide, not removable by washing, the presence of which, it was alleged, gave rise to this insensibility. We now see, first, that the alleged insensibility does not exist at all: and, secondly, that none of the iodide can be retained after a proper washing, because if it was retained, the iodide of silver would be thereby prevented from receiving the latent image. The experiments already detailed show that such an image is most undoubtedly received. It therefore follows that alkaline iodide cannot remain present with the iodide of silver. This view must, therefore, be abandoned, and it is a little curious to observe what vehement discussion has occurred as to the explanation of the cause of an insensibility which has no existence.

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[*] Concluded from p. 261.

I described, not very long back, a series of experiments on the effect of ozone developed by chemical reactions (slow combustion of phosphorus, and action of sulphuric acid on chameleon mineral) upon iodide and bromide of silver, prepared in the presence of excess of the alkaline salt. In these experiments I employed exposures of a length based upon those given for ordinary negative development, and in no case very greatly exceeding them. It now appears, that those exposures, to have brought out the sensibility described in the present paper ought to have been materially prolonged.

It was my intention to have resumed and repeated these experiments with the further light that I have since obtained. But I have been deterred from doing so, by the great irregularity which marks the results in the experiments described in this paper. It would constantly happen that two pieces of paper prepared, as nearly as possible, in the same way, or even two pieces of paper cut from the same prepared sheet, and exposed successively under the same negative, to the same light, and for the same time, and developed in the same manner, would give quite different results. Under these circumstances, to introduce another new agency, and to expect to obtain conclusive comparative results, would be out of the question. I did, indeed, make one or two experiments, by dividing a piece of paper into halves, exposing one half to the action of ozone (generated by the slow combustion of phosphorus) for a certain time, then placing them both under the same negative, and exposing and subsequently developing them together. These results, so far as they went, corroborated my previously-expressed conclusions, that ozone, so generated, does not heighten the sensibility of iodide of silver formed in the presence of excess of alkaline iodide. But I am by no means disposed to attach too much weight to one or two experiments. It would be necessary to repeat them oftener than I can do at present to arrive at a positive result. I can simply aver that the half of a piece of paper, which was exposed for five minutes to the action of ozone, developed exactly like the other half which had not been so exposed. In fact, in the present examination, I have had but a single object in view, the settlement of the question as to whether the so-called "insensitive" iodide of silver really deserved that appellation. I think it is apparent that it does not, and that, as I before said, the two varieties of iodide of silver differ in their properties, not in kind, but in degree.

The relations to light of *bromide of silver* have been less studied than those of the other silver haloids. Especially of bromide of silver formed in presence of excess of alkaline bromide. We know, indeed, from Vogel's extended researches—researches as valuable from the plain, clear, and logical manner in which they are presented, as from the experimental skill with which they were conducted, that bromide of silver when exposed to light disengages bromine very easily, with formation of subbromide, differing in this essentially from the iodide, which exhibits no such reaction.

I do not remember to have met any expression of opinion as to whether simple bromide of silver, formed in presence of alkaline bromide, and not modified by subsequent treatment, is capable or not of receiving a latent image, susceptible of development. That it is capable, experiments of my own leave me in no doubt. However its chemical reactions under the influence of light may differ from those of iodide of silver, its capacity for undergoing the physical change, which leads to the production of a latent image, is the same.

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ON CHROMATYPE.

BY PAUL LIESEGANG.

All the processes in which a chromate is employed, such as the carbon process, photolithography, &c., may be grouped together under the designation of *chromatype*. It is not easy to introduce a strictly scientific nomenclature into photography, nor is it necessary. It is difficult, also, to discern in processes with salts of silver, and in processes without salts of silver, what divides organic from inorganic chemistry. Science, like nature, knows no limits of separation without transition. Still, it will be convenient to group together the processes in which the same sensitive substance is employed. Chromic acid, (CrO^3) is a combination of oxygen with the metal chromium, It is prepared by treating the chromate of potassa with sulphuric acid: it crystallises in brown deliquescent needles. Bichromate of potassa finds many applications in the arts—it is used in dyeing, in preparing yellow and green pigments (chrome yellow, chrome green), and it serves for the production of other combinations of chrome. This salt is a bichromate, because one equivalent of potassa is combined with two equivalents of chromic acid. Chromate of potassa is yellow, while the bichromate is red. The bichromate of ammonia also is red—the chromate is yellow. We have also trichromates, but I believe they have not yet been employed in photography.

If chromic acid, or a bichromate, be exposed to heat or to light, in contact with an organic substance, such as alcohol, sugar, gelatine, albumen, gum arabic, &c., a singular change takes place. In chemical parlance, it yields a part of its oxygen to the organic matters, or is reduced. While in chromic acid there are three equivalents of oxygen combined with one equivalent of chrome, brown oxide of chrome (CrO^2), which results from the reduction of chromic acid, possesses only two equivalents of oxygen to one equivalent of chrome.

If the reduction be continued, and heat readily effects this reduction, we obtain oxide of chrome (Cr^2O^3) which contains one and a half equivalents of oxygen to one equivalent of chrome. Usually we take the brown oxide (CO^2) for a combination of the oxide (Cr^2O^3) with chromic acid—Cr^2O^3, CrO^3. It is this combination which is formed when we take an impression upon paper prepared with a bichromate.

$CrO^3 +$ organic matter $= CrO^2 +$ organic matter $+ O$, the paper never being so long exposed that the green oxide makes its appearance.

The chromates or bichromates themselves are changed by light—they must be placed in contact with something which will remove the oxygen from which they are so ready to separate. But the organic matters which are so adapted are in their turn changed in their properties by oxidation. Albumen, gelatine, and gum arabic, for example, which are soluble in water, become insoluble. This change has been turned to account in a series of photographic processes, the most important of which we will proceed to describe. If we mix powdered carbon with albumen, after exposure to light, only the parts parts preserved from the action of this agent are soluble, and we have a carbon picture. If we take an enamel colour instead of the carbon, we obtain a picture which can be fused in the furnace. If we cover the brown proof with lithographic colour, we obtain, after washing, a picture which may be transferred to lithographic stone or metal plate. In cold water, the parts of the proof which remain soluble swell, and we obtain a plastic proof upon which plaster may be poured, and employed like *diaphanie*, and which may be converted into a copper plate by the electrotype process. Other applications present themselves, when we have recourse to the art of dyeing.

At first, bichromate of potassa was employed, just because this salt was easily procurable: but it was soon discovered that bichromate of ammonia is more easily and quickly reduced by light. Some time ago, M. Kopp proposed to employ, in the room of these salts, the double chromate of potassa and ammonia, which is obtained by neutralizing bichromate of potassa with ammonia. A little consideration points out the salt which unites the advantages of bichromate of ammonia with those of the chromate of potassa and ammonia. This is simply the yellow chromate of ammonia. This salt is wholly without action upon organic matter in the dark, and it parts with its ammonia very readily. This last property is opposed to the keeping of chromated paper: but I have employed with much success in the preservation of chromated papers, the same apparatus I employ to fumigate albumenized paper with ammonia. In an atmosphere of ammonia the paper prepared with the yellow chromate of ammonia, remains yellow and sensitive as long as may be required. Mr. Swan's preparations of gelatine also keep very well. We frequently hear complaints of the impossibility of keeping gelatine films. The following expedient will overcome the difficulty. Put the gelatined papers into a box in which a small piece of carbonate of ammonia, or a drachm or two of *aqua ammonia* is placed. The carbonate is preferable, because dry papers are more sensitive than those which are wet.

We obtain chromate of ammonia by slowly evaporating a solution of chromic acid supersaturated with ammonia, or by evaporating in a *bain marie* this solution, to which some pieces of carbonate of ammonia are added. Without this precaution, we obtain bichromate instead of chromate. But it is not necessary to prepare this salt, it is sufficient to dissolve bichromate of ammonia in *aqua ammonia*.

It has been proposed to add other matters to the bichromate to render it more sensitive; such as alloxantine, and sugar. If other oxidisable matters are present, the bichromated alloxantine cannot act, because it behaves in the same manner as other oxydizable substances. It is the same with sugar. There is then no advantage in employing them in the photographic processes, in which we always make use of albumen, gelatine or gum.

If bichromate of potassa be dissolved in hydrochloric acid, we obtain, by evaporation, a beautiful red salt, known as *Pelouze's salt:* it is a chromate of the chloride of potassium. I have remarked that the mother liquor of this salt tinges the filtering paper green, while every other chromate tinges it brown. The fact that Pelouze's salt is more completely decomposed by the organic substance and by light, seems to indicate greater sensitiveness. I have made a solution of bichromate of potassa in hydrochloric acid, and floated albumenized paper upon it, (the albumenized side upwards), until the albumenized film became of a uniform yellow colour. This paper was not more sensitive than the paper prepared with chromate of ammonia: in the positive printing frame it gave a brown picture, which I covered with lithographic ink to transfer to a zinc plate. But upon treating this proof with warm water to remove the ink from the non-exposed parts, I did not obtain a positive picture as usual, but a negative. The Pelouze salt may, therefore, replace the mixture of chloride of iron and tartaric acid, to obtain positive pictures direct from an engraving, or to multiply negatives.—*Le Moniteur de la Photographie.*

THE WET COLLODION PROCESS WITHOUT THE USE OF THE NITRATE BATH.

BY NELSON K. CHERRILL.*

In bringing before you this evening a short notice of a method of securing photographic negatives without the use of a nitrate of silver bath, it is not my intention to describe minutely all the experiments which have been made in order to obtain the required results, but only so far to enter upon the manipulatory detail as is necessary, in order to render the remarks which I shall have to make more intelligible.

The usual method of taking negatives is now so well and generally understood, that it would seem almost out of place to spend any of the time on the present occasion to its consideration. I may venture, however, to give a brief *résumé* of the practical manipulation involved. A clean plate of glass is coated with a substance known as iodized collodion, which, after sundry precautions, is plunged into a solution of nitrate of silver; while it is in this bath a decomposition is carried on, which will be more clearly understood by reference to the diagram than by any verbal explanation.

When the plate is removed from the bath it is placed at once into the camera without any previous washing.

It will be here seen that, besides the iodide of silver shown in the diagram, there must be clinging to the plate some solution of nitrate of silver from the bath. And thus we have all the conditions fulfilled which were considered, until very lately, as essential to the production of a photographic image, viz., iodide of silver, with free nitrate in excess.

Now, some time ago it was thought that the bath and collodion might be mixed up together in one bottle, so to speak; that is, that the collodion might be sensitized by mixing with it some nitrate of silver. Some time ago I tried some very similar experiments, and meeting with more success than I at first looked for, I have continued these experiments whenever opportunity occurred. In the method of working which I adopted, I poured the collodion into a mortar, and then mixed with it some nitrate of silver in considerable excess; the result, after being left to settle, was found to be a sort of liquid film already prepared for use; that is, being poured out upon the plate, it might be exposed in the camera without any further treatment; thus I thought to do away with the trouble of using the nitrate of silver bath.

The decomposition which takes place in this case is exactly similar to that which takes place in the former case, but the result differs in this one important particular: in the former case, as seen by the diagram, the nitrate of potassa is left in the bath, but in this case it remains in the collodion. A small quantity of nitrate of silver in a free state is dissolved by the alcohol of the collodion, and thus the same conditions appear to be fulfilled as in the former case, viz., iodide of silver, with nitrate in excess with nitrate of potassa. Of this salt I shall have more to say in a minute or two. I must now come to the consideration of the action of the light upon these two differently prepared plates.

It has been shown lately by Dr. Vogel, of Berlin, that in order to render the plate sensitive to light, it is only necessary to apply to it some substance capable of absorbing iodine; for the action of light is to liberate that substance from the iodide of silver, and if not absorbed as fast as it is formed it will prevent the further decomposition of the iodide. Now, in the first process spoken of, we remember that the plate was put into the camera wet—wet with a solution of nitrate of silver; and as fast as the iodine is liberated by the action of light, it combines with some of this nitrate and forms more iodide of silver.

In the process without the bath solution, it will be seen that the iodine will combine with the free nitrate described as being dissolved in the collodion in just the same way. A very curious result has just been obtained, however, while experimenting upon this subject leads me to think that the nitrate of potassa is also affected by the free iodine.

A plate prepared in the manner before described, without the use of the nitrate bath, was exposed to an interior view of a greenhouse for about 1 minute, with a medium stop, about an hour before sunset; and the result is before you on the table.

The negative you see is certainly fully exposed with considerable delicacy. A few days later I took, or rather tried to take, a negative of a group of fern leaves on a sheet of white paper. The sun this time shone on them with full vigour, the collodion, &c., being in exactly the same state as before. I exposed for ten minutes with the full aperture, and the result you see *not over-exposed,* as you might have imagined, but *under-exposed.* The image came out very weak and thin, requiring a considerable amount of "piling up" of silver to make it of any reasonable density. It seems very difficult to account for this phenomena, and the only idea that seems at all likely to prove a satisfactory theory is, that the iodine (perhaps after decomposing all the free nitrate) attacks the nitrate of potassa, and in some way, probably by liberating too much nitric acid, retards the process of development, and that to such an extent that, by prolonged exposure, it would seem as if the whole of the picture could be removed, as, after the proper time, the longer exposed, the less exposed the picture looks.

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* Read at a Meeting of the West Kent Microscopical, Natural History, and Photographic Society.

I may here state that, in the greater number of experiments which I have tried, the exposure seems to have varied from about the same to about double that of wet plates.

Almost every method of development that I have tried seems to have succeeded. I have tried protosulphate of iron and the ammonia-protosulphate, both with and without formic acid and sulphate of copper. All seem to work, but I have got the best results from a mixture of the ammonia-protosalt and sulphate of copper—a formula that was recommended some years back for wet plates, but which I never used for that purpose.

Sometimes I have developed the plates in a dish, and sometimes in the usual way, after a short washing in distilled water.

After the announcement of the valuable discovery by Dr. Vogel, that the action of a sensitizing was only to absorb iodine, I think it will be seen that nitrate of silver is not by any means the best substance to use in this process as a sensitizer. Indeed, the moment I saw the notice of it in the Photographic News a few weeks ago, I thought it would be my best plan to make many more experiments in the new direction pointed out, and to leave my paper for the present; but I found that I was too late to draw back, and having put down my name for a paper upon this subject, I felt bound to come before you this evening with the experiments as they are, even in a confessedly imperfect condition.

I have only to hope that I may soon be able to try some more methods of working this process, which I may venture to think contains the germ of some advantages quite adequate to the amount of labour bestowed on its most careful consideration.

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ANALYSIS OF SILVER BATHS.*

BY MM. BARRESWILL AND DAVANNE.

Table of the Equivalent Weights of Chloride of Silver, Nitrate of Silver, and pure Silver.

Chloride of Silver.	Nitrate of Silver.	Pure Silver.
1	1·1851	0·7527
2	2·3702	1·5054
3	3·5553	2·2581
4	4·7405	3·0108
5	5·9256	3·7635
6	7·1107	4·5162
7	8·2958	5·2689
8	9·4810	6·0216
9	10·6661	6·7743
10	11·8512	7·5270

By simply removing the decimal point, we can make this table serve for any quantities.

Suppose, for example, that an experiment gives 2·98 of chloride of silver. We do not find this number at once in the table, it is true, but we can obtain it by distributing it in the following manner:—

$2{\cdot}98 = 2 \times 0{\cdot}9 \times 0{\cdot}08$ or
2 units.
9 tenths.
8 hundreths.

Now we find in the table:—

2 = 2·37 nitrate of silver, is ... ... 2·37
9 = 10·66, but this number is ten times too great, for we require the value of nine tenths: we, therefore, divide it by 10 ... 1·06
8 = 9·48, this number is 100 times too great: divided by 100, it is ... ... 0·09

2·98 of chloride of silver equal, in nitrate of silver, to 3·52.

Note.—The chloride attached to the bottom of the capsule is very adherent; drop upon it some water acidulated with sulphuric acid, and touch it with a piece of zinc, or let a small piece of this metal fall into the capsule; it soon becomes possible to remove the bottom of chloride of silver in a single piece.

We believe it will be useful to give another table, by the aid of which we can immediately determine what a given weight of silver will yield of nitrate, and reciprocally, what a given weight of nitrate will give of silver. We employ this table in the same manner as the preceding.

Table of the Reduction of a weight of Pure Silver in Nitrate of Silver, and vice versa.

Pure Silver.	Nitrate of Silver.	Nitrate of Silver.	Pure Silver.
1	1·5744	1.	0·6351
2	3·1489	2	1·2702
3	5·7234	3	1·9053
4	6·2979	4	2·5404
5	7·8724	5	3·1756
6	9·4469	6	3·8107
7	11·0214	7	4·4458
8	12·5959	8	5·0809
9	14·1704	9	5·7160
10	15·7449	10	6·3514

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THE TRIALS OF THE WIFE OF AN AMATEUR PHOTOGRAPHER.

[The following amusing letter appears in the *Philadelphia Photographer*, as a pendant to an an article describing the trials of a photographer. We hope that photographers will take a hint and mitigate the trials of their gentle partners as much as possible.—Ed.]

You describe very graphically the arrival of a ship in the harbour, and refer to the perils she has escaped ere she has completed her voyage, and thus illustrate the manifold dangers of a photographic plate, ere it is successfully finished. Suppose we change the figure a little, and fancy a "long low black schooner," with lines that enable her to enter the water like a knife, and leave it without a ripple. It is all very well to think of the dangers she has *escaped*, but what about the injuries she has *inflicted!* What unfortunate merchantman has she not overhauled and robbed! What smaller craft has she run down, and wrecked! What waste of burning and scuttling has attended her successful cruise!

Now, a photograph may reach perfection after many perils, but I can testify from experience, that it reaches the same goal, after inflicting many injuries, particularly on the wife of the enthusiastic operator in the art. Is it nothing, Mr. Editor, to come, and find your best china-closet converted in a dark den for the preparation of "plates?" To find your "plates" all ruined, whatever fate may have befallen your artistic husband's? To find "nitrate of silver," where you left the cleanliness of pure porcelain, and the flavour of chemicals, where you spread the aroma of white soap and dry linen? Is it nothing to have "cook" come and say, "Why, marm, we can't have any pudding to-day, because master has broken the dish," and, on enquiring, learn that said dish, with many other dishes, has been broken, in order to form a picture of exquisite beauty, viz., a child crying over the dilapidated crockery! To be sure, the picture is exceedingly pretty, I can't deny that; but a fine photograph is no substitute for a good pudding!

And then as to eggs! why, sir, I can't get an egg when I want it, for all the eggs are in a basket, and "master" needs them for his "groups" of "bird's nesters," or "egg crackers," or some other effort of high art, and "historical photography." And the baskets! "Mary, where is the egg basket?" "Why, missus, master has it in the field; he's sperimenting with it!" Sperimenting, indeed! and what am I to do in the meantime? What substitute is a fine picture for a substantial basket? Can you carry eggs on a photographic plate, or make a custard or pudding out of the cleanest and best toned print?

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* Concluded from p. 244.

Then, the children, poor souls, they can't get well interested in any little game, but they are forthwith stopped, and made to stand immovable, to be photographed! They have formed, as children will, when left to their natural instincts, a beautiful group, and they must be at once put, not *into* but *on* glass, to their great discomfort. They dread the camera, and disperse when it is pointed in their direction, as cunning crows, when they see a gun levelled at them. And this reminds me of a little incident.

You know chickens are exposed to a disease called "the gapes." It is an affection of the throat, causing the bird to gape as a man might, but ending, if not checked, in death. Now, a friend of mine found out the cause and cure of this disorder. The cause was a double-headed worm, which fixed itself in the interior of the bird's throat, and the cure, the insertion of a well-greased feather into the trachea of the chickens, which feather, after being turned about and rubbed up and down, brought up the worm, and relieved the chicken, if it did not choke it! Well, this operation was, of course, anything but pleasant, and so the chicken thought. When, therefore, one of them detected himself or herself in *gaping*, he or she immediately started off full run, in fear of the feather, and was not to be approached by any one armed with such an instrument of torture! In like manner I expect to see the children all scatter and run as soon as that dreadful camera makes its appearance, and there is a prospect of being "grouped" and photographed. Even our dog knows what the camera means, and hangs his head, and skulks away with his tail between his legs the moment it is pointed towards him.

But the children are not the only victims. It is the wife that bears the burden. She desires the company of her husband to pay some necessary visits. "My dear, suppose we go to-day and see Mrs. A. or B.?" "Well, really, my love, it is so clear and still a day that I should like to take some views;" or, "I have some negatives which I want to print, and the light is first rate;" or, "I have prints to wash, or plates to clean, or something to do, and I can't well go to-day." To-morrow brings other impediments, and the visit is postponed, and eventually not paid at all.

The last instrument of torture is a carriage, which can be converted into a dark operating-room, instead of the ordinary tent!

Photography on wheels! Why not take a small anchor or kedge, with a few fathoms of chain cable! Indeed, I shall certainly provide myself with a select library and portable cooking-stove, so that I can make things comfortable when we are not "storm-stayed," but "view stopped," and photographically fixed. Only imagine what will be the result of this new invention! We start for a drive. The day is delightful, the roads are delectable, but we hardly travel half a mile before the horses are pulled up! Here is a fine view, so we must stop and take it! The carriage at once becomes a hearse; the occupants are ejected; many things go wrong, while some go right; husband is cross, and scolds. Our ride is ruined! We might as well have staid at home, and darned stockings!

And talking of darning, what aggravations are experienced by the careful wife of the amateur photographer in the matter of raiment. Bless your heart, Mr. Editor, did you ever see a photographic shirt or handkerchief? Did you ever see the havoc of acids on shirt bosoms, and sleeves, and wristbands? Those beautiful bosoms that I had stitched with so much care, and inserted so neatly, why, when they came out of the wash, they were as black as the chimney-back. A vial of some abominable acid had been spilled, or had spattered on them, and they were ruined! Hood has written a very affecting "Song of the Shirt," in which the burden is "Stitch! stitch! stitch!" Well, sir, I can write quite as touching a one, of which the burden shall be, "Scrub! scrub! scrub!" and mine will be the more pathetic, because stitch, stitch, stitch, does something, however wearisome it may be, but scrub, scrub, scrub, does nothing but make holes in the linen, and aggravate the mischief.

Look, too, at my carpets, if you please! We take "interior views," we do, and likewise "family groups indoors," and so the carpets testify very plainly. Why, sir, the "progress of science" is indelibly recorded all over my stairs, in great black blotches and defaced paint! Each "landing" may be regarded as an "epoch," and future chemists can come and study their science, by means of extracts from my druggets and ingrains, just as present geologists study their science by means of "coal-measures," and old red sandstone layers, and like deposits. Deposits, indeed! There is enough "deposited" on my floorcloths to exhaust anything but the patience of a saint. But I bear it! Rooms, which in the simplicity of my confiding nature I allowed to be used as photographic closet or dark-workshops, having been accepted in the condition of parlours, have been left in the state of pigstyes. The smell of them, sir, is awful, the appearance appalling, the defilement of them irremediable! I now have faith in homœopathy, or infinitesimal doses of all drugs and chemicals.

I tried the plan of assigning my husband a place for work out of the main dwelling. This saved my carpets, but I never saw my husband. He lived in his outside den, and only paid me hurried and rare visits. This was not endurable, so I gave him a room in the house again. This was not much of a gain. I *saw* little more of him, and though I heard more, it was only his growls as he went down stairs, complaining at being called away, just when some critical operation was in progress.

I thought, Mr. Editor, when I married, that I gained a husband; but I find that I was mistaken—I only married a "camera." I did not take my partner "for better, for worse, till death us do part," but only for "absent and occupied, till baths were exhausted, and weather forbid work!" I consider myself nothing but a martyr to photography, and shall apply for a divorce ere long, on the ground of "desertion."

Well, sir, as a wife, as a helpmeet, we are invited into the fields. We cannot be of any assistance; of course, not; but as a special favour we are permitted to witness the triumphs of artistic skill! Would you believe it sir, we are drudged and driven about in the most ruthless manner. We must run for water, and wash plates and dry them, and at the same time stand as points in the views; be here, there, and everywhere, and abused if we betray weariness, or fail to divine our artist's somewhat confused ideas and undeveloped purposes. Nothing but the most angelic sweetness of temper could endure the trial; but I bear it!

And what does it all come to? When, at the cost of infinite time, and patience, and money, a batch of photographic negatives has been secured; when, after endless delays, they have been printed and mounted, why they fail to satisfy. Some are defective, and don't please, and all are not quite as good as Mr. Somebody else's, and so disappoint the operator. He must have a better lens, or a bigger camera, and all the apparatus proportionately enlarged.

Then the cost of a fine camera, and sufficiency of chemicals, with tent and other addenda! Do you know the price of these things? Of course you do. How much does a large bath of nitrate of silver come to? And the tent, and the plates, and the bottles full of solutions! of gold among other things! Pray, what is the sum total? This is not a conundrum.

All these things are needed, and will be furnished, and when I want a new bonnet for myself or for one of the children, or a new dress, or new furs, or new anything, I find they can't be afforded—the camera has cost so much; the chemicals are so expensive; the tent was torn and needed to be attended to; another lens was required, and chemicals like gold have "gone up!"

Now, Mr. Editor, how long is this state of things to be endured? I am naturally of a sweet disposition, but really I can't stand these trials much longer. If a man may be held answerable by the laws for wasting his substance in insane experiments in search of perpetual motion, or the philosopher's stone, why may not an action be commenced *de lunatico inquirendo* (I believe it is called), when an amateur in photography leaves his wife and children without suitable bonnets, furs, and dresses, because he spends all his substance in cameras, baths, tents, and Sibbald's New Photographoscope Catoptric Lantern!
—Truly yours, A Sufferer.

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ON SECONDARY IMAGES ON THE COLLODION PLATE.

BY M. CAREY LEA.*

On examining a negative which I took of some buildings, I saw with surprise that a portion of the image was completely double. A gable and a façade, not far from the centre of the plate, were both represented twice; one image was vertically over the other, and about two-tenths of an inch above it. As the portions which were thus repeated, stood out boldly against the sky, the effect of the second image was very striking. On one part of the building was a cross, which was clearly and plainly repeated in the sky, about a fifth of an inch above the true image. These effects were entirely local, covering a space of perhaps two inches long and less in width. Elsewhere on the plate nothing of the sort appeared. It could not, therefore, have been caused by any accidental displacing of the camera.

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* From the *Philadelphia Photographer*.

The first suggestion was naturally that it was the effect of reflection from the back surface of the plate, but an instant's consideration showed the impossibility of this as a cause. The appearance was near the centre of the plate, where the rays strike it perpendicularly, and the plate was but about a tenth or twelfth of an inch thick. The deflection of the rays by refraction in the substance of the glass would only act to bring the two images nearer together, and it would be utterly impossible that the two images could be separated so far by any such cause.

An explanation has suggested itself, which appears completely satisfactory: that the abnormal image has been caused by a spot of water or bath solution on the inside back of the dark slide. Such a spot might easily produce a reflecting surface, capable of throwing back an image, and its influence, like the effect observed, would be altogether local. I think there can be little doubt that this is the true key to the peculiar result which I am describing, and regret that it did not occur to me in time to be verified by observing the slide.

If this explanation be the true one, it evidently indicates that the collodion films which we employ do not utilize the entire actinic force of the image, but that a portion is lost by transmission through the film. This must evidently render a longer exposure necessary than if we could employ the whole force of the camera image.

While on this subject, a few words may be said on a kindred one, which has lately been much discussed in England, on the blurring of tannin pictures. Various expedients have been proposed to prevent this trouble. The use of yellow glass, which some have proposed, is evidently impossible, as no positive printing could be done through it. Some propose to paint the back of the plate with yellow colour, and others to attach wet red blotting-paper to it. These are evidently very imperfect methods, because the reflection takes place at the inside surface, and application of paint or wet paper to the exterior still leaves the surface uninjured, and although the reflection may be lessened somewhat, it can never be destroyed.

It would seem, therefore, every way easier, simpler, and more effective to render the film itself more opaque to chemical rays, and the simplest way of effecting that would be to add some red substance to the collodion. The finding of a substance possessing all the needful properties is not easy. It should be soluble in collodion, and insoluble in water, or else it would be removed by the nitrate bath. It must also resist the action of nitrate of silver, but should be destroyed by hyposulphite of soda, or else some special method of removing becomes necessary, involving an additional operation. The only substance which I have tried, as respects the qualities just mentioned, is rosaniline. This, I find, possesses all the requisites except the last. It dissolves easily in the collodion, and resists both water and nitrate of silver. But it also resists both hyposulphite of soda and cyanide of potassium. It therefore would not disappear in the fixing, and it would be necessary to let the plate, after fixing, rest for a while in alcohol. Or, better, add sufficient alcohol to the fixing solution to dissolve it out. I hope very shortly to verify this suggestion by actual experiment, which, so far, it has been impossible for me to make.

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Proceedings of Societies.

Photographic Society of Scotland.

The following is the Annual Report of the Council of this Society:—

The Council, in accordance with the Laws of the Society, have now, at the conclusion of the ninth year of its existence, to present their Annual Report to this meeting.

The Council are glad to have it in their power to report the continued efficiency and prosperity of the Society, although they have still to regret the want of additional members, and would again urge upon every one in the Society the desirability of doing their utmost to add to their numbers, as the best means of increasing its usefulness and strength.

The following papers have been read during the session:—

On a New Method of Photographic Printing; by Mr. Thomas Fox, Alloa.

Printing in Carbon, illustrated; by Mr. John Pouncy, Dorchester.

On the Application of the Camera and Lantern to the Illustration of Popular Science; by Professor Archer.

New Collodion Printing Process, applicable to Vitreous, Enamelled, and other surfaces; by Mr. James G. Tunny.

On the Glass Room and Portrait Camera; by Thomas Sutton, B.A., Jersey.

On the Temperature of the Bath and Developing Solution, as affecting Photographic Operations; by Mr. Thomas Rodger, St. Andrews.

On the Wothlytype Process; by Mr. J. T. Taylor, London.

It will be seen from the above list that the importance and interest of the communications read to the Society have in no way fallen off.

At the request of many members of the Society, the Council were induced once more to make arrangements for a General Exhibition, although with the knowledge that no better room could be had than the one which was previously found to be so unsatisfactory as regards situation.

The Exhibition was accordingly open from 20th December to 18th February; and the Council are glad to report that, photographically, no previous exhibition has been such a success, whether as regards the beauty or the variety of the works exhibited.

The Committee appointed by the Council selected the following pictures, for which they recommended that the silver medals of the Society should be awarded:—

To Mr. H. P. Robinson (London) the medal for portraiture, for his picture of "Brenda;" Mr. James Mudd (Manchester) the medal for landscape, for his View of "Dunham Park;" Mr. Thomas Annan (Glasgow) the medal for the best View in Scotland, for his "Dumbarton Castle;" Mr. John Smith (Darnwick Tower) the medal for the best view by an amateur, for his picture "On the Leader, near Melrose;" Mr. J. Ramsay L'Amy (Dunkenny) the medal for the best group; Mr. Samuel Highley (London) an extra medal, for a series of Microscopic Objects, enlarged for the magic lantern; the Pantascopic Company (London) an extra medal, for Panoramic Views taken with the pantascopic camera.

The Council are glad to say that, to judge from the letters of acknowledgment returned by those who received them, the medals of this Society are held in the highest possible esteem, a proof that the various Prize Committees have successfully striven, through a series of years, in their difficult and arduous task, to give honest and conscientious awards.

The Council have to regret, however, that this Exhibition, like its last predecessors, has proved a failure financially, the loss to the Society being £48 13*s.* 9*d.* This has been the fate, more or less, of every recent Photographic Exhibition, and is the more to be regretted, as it is the opinion of some of the best photographers in the country, and others qualified to judge, that the future progress of this beautiful art depends more on public exhibitions for its advancement than on anything else.

The Council have this year selected for distribution to the Society the prize portrait by Mr. H. P. Robinson, entitled "Brenda." This fine specimen of portraiture is now being printed, and will shortly be distributed to the members.

In order to facilitate the prompt publication of the reports of the meetings in the *Photographic Journal*, the Council would recommend that the monthly meetings of this Society be held next session on the *first* Tuesday of the month, in place of the second, as at present, which would allow ample time for the report to appear in the first publication after each meeting, which is frequently impossible under the present arrangement.

Keeping in view the loss sustained by this year's Exhibition, the Council would recommend that the Council now to be elected consider, during the summer, whether there should be a General Exhibition, or not, next session; but that the Society offer the following Medals for competition :—

For the Best View taken by a dry process; the details of the process to be communicated to the Society.
For the Best View, taken by an Amateur, by any process.
For the Best Portrait.
For the Best Enlargement (View of Architectural Subject).
For the Best Enlargement of a Portrait.

Enlargements must be, superficially, at least four times the size of the original picture.

The Council to have the power of awarding extra medals for any picture of sufficient merit which may not have been included in the above list.

All the pictures must be untouched, and from single negatives, except in the case of Views, which may have the sky printed from another negative, or they may be toned or shaded before fixing.

As required by the Laws of the Society, the President, the Senior Vice-President (Mr. Horatio Ross), the four Senior Members of Council (Messrs. A. Y. Herries, J. Ramsay L'Amy, Thomas Bell, and William Walker), the Honorary Secretary, and the Honorary Treasurer, retire on this occasion, but are re-eligible.

The Honorary Secretary, however, has intimated a desire to retire from office.

The Council would suggest that the President be re-elected; that Mr. George Moir be elected Vice-President, in room of Mr. Horatio Ross; that the Treasurer and Auditor be re-elected; that Colonel Bell be elected Secretary, and that Messrs. Horatio Ross, Archibald Broun, T. B. Johnston, and W. D. Clark be added to the Council, in room of Messrs. J. Ramsay L'Amy, William Walker, George Moir, and Colonel Bell.

Abstract of the Honorary Treasurer's Account.

From the Account of the Honorary Treasurer, which, with the Docquet of the Honorary Auditor, certifying its accuracy, was laid before the Meeting, it appears that

The sum of the Charge is	£433	16	0
The Discharge is	170	12	10½
Balance in favour of the Society	£263	3	1½

List of Office-bearers, 1865-66.

Patron.—His Royal Highness the Prince of Wales.

President.—Sir David Brewster, K.H., F.RS., &c., &c.

Vice-Presidents.—Rev. D. T. K. Drummond; George Moir.

Council.—Horatio Ross; James G. Tunny; Wm. Scott Elliot; C. G. H. Kinnear; T. B. Johnston; Archibald Broun; W. D. Clark; A. Y. Herries.

Honorary Treasurer.—H. G. Watson.

Honorary Secretary.—Colonel Thomas Bell.

Honorary Auditor.—John Cay.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, June 7th, 1865.

Mr. Waldack, of Berlin, who was appointed to make experiments upon the new chloride in collodion process, with the view of testing its merits, has reported the results obtained to the Berlin Society; exhibiting also specimens which fully sustain the claims put forth for this new method. The collodion he employed consisted of

Plain collodion sp. gr. 0·76 ... ... 75·8 parts
Chloride of calcium ... ... 0·5 „

dissolved directly in the collodion; then add, after first dissolving in water,

Fused nitrate of silver ... ... 1·5 parts

and dilute the mixture with 9 or 10 parts of the alcohol, with which the vessel in which the nitrate was dissolved was rinsed out.

This quantity is amply sufficient for a half sheet of paper (Schering's arrowroot, non salted). It is considered very remarkarble that the chloride of silver in suspension has not the least tendency to precipitate; after several days, the solution had not the slightest trace of sediment at the bottom of the vase; it retained all the properties it possessed at first, and its aspect may be well compared to milk. The chlorided collodion is spread upon the paper by simple affusion; it suffices to fix the paper on the board, the operation presenting no sort of difficulty, the collodion being as fluid and flowing as if it contained no chloride of silver. The exact proportions of this substance are not yet exactly determined; they embrace very extensive limits without appearing to influence the proof in any way. We may also expect that the process will become even more economical than it is at present. Printing, retouching, and colouring, are executed with facility and rapidity.

Mr. Hilles recommends a very simple and efficacious method of intensifying negatives. It consists in the employment of the double oxide of iron and ammonia as developer, and strengthening with the same substance mixed with nitrate of silver.

Colouring proofs with aniline colours is attended with some difficulties in inexperienced hands. The colours are too rapidly absorbed, and a preliminary coating of glycerine has been recommended, to obviate the inconvenience; but the following method is said to be infinitely better.

The *carte* must first be glazed, then, by means of a common hair pencil, coated with a mixture of equal parts of white of egg and water. To thoroughly incorporate these two substances with each other, they may be put into a bottle and well shaken. The dried proof takes the colours perfectly well. The *substratum* of albumen imparts more brilliancy and uniformity to the colours, and in no respect impairs their beauty.

M. Pierre Petit has introduced a novelty in *cartes* which has already become quite popular. On one side the *carte* presents the ordinary appearance of a visiting card with name and address, but the upper left hand corner is turned over on to the face of the card, and upon this triangular space a vignette portrait is printed. M. Petit is one of our most active and ingenious photographers, and everything he produces is worthy of attention. His *Galerie des Illustrations Contemporaines* is one of the most interesting applications of photography to illustration that we have ever seen. Each number contains a portrait, a biographical memoir and an autograph of some eminent statesman, divine, politician, artist, author, or *savant*. The photograph is transferred to stone by M. Lemercier.

Our photographic exhibition is made up of the contributions of about one hundred exhibitors, including foreign and native; but in consequence of the large number of frames sent by certain individuals, the exhibition is a very full one for a period when the perfection already attained renders progress more difficult.

An album of 158 photographs, by the Viscount Aymard de Ballville, is an attractive feature. They consist of views in Egypt, taken in connection with the scientific mission of Viscount de Rougé, an account of which appeared in the Photographic News a few months ago. The views exhibit the highest excellence; in fact, are as perfect as it is possible such works can be. Sharpness is carried to such a pitch that the lines seem to be scratched with a diamond point. Of course this effect is due as much to the rare atmosphere of Egypt as to the excellence of the lenses.

The Taupenot process, the unacknowledged parent of so many *quasi* new processes, is well represented in fourteen views by M. Davanne, which combine every desirable quality—

good tone, delicacy, &c.—and display the hand of a master.

Dr. Van Monckhoven has just published a new edition, making the fifth, of his *Traité Général de Photographie.* This work, which doubtless takes the first rank in works on photography, is considerably modified in this new edition. Thus, the second part, comprehending the application of photography to the sciences of observation, which in the fourth edition occupied at least a hundred pages, is now reduced to forty, while the practical portion has been proportionally increased.

Toning paper positives has received a large share of the author's attention, and is a very complete summary of all the formulæ in vogue in France, England, and the United States. The chapter on enlarging is also as complete as the limited space of such a volume permits. The author describes the apparatus he has invented himself for this purpose, and, in good taste, he has not passed over in silence the inventions of his competitors, but criticised them, and even pointed out their merits.

In a copious chapter on photographic optics, Dr. Van Monckhoven has given everything useful respecting the theory of objectives, their excellences and defects, together with the mode of employing them. This constitutes an invaluable feature of the work, and one that was much wanted.

ANILINE COLOURS FOR PHOTOGRAPHS.

Sir,—In last week's issue of the Photographic News, page 262, I was pleased with the perusal of an interesting and instructive letter from a Mr. Albert, in Leeds, respecting the permanency of aniline colours, more especially as it may lead to further communications from gentlemen who may have been in the more frequent habit of using these beautiful tints. If their permanence can be ensured, these colours will prove a great boon to photographers, particularly to amateurs who may be in the practice of photographing, and of subsequently colouring, select objects of natural history or choice works of art.

With the view of testing the effects of light and time on the above-named colours, I some time since procured a specimen card of Judson's aniline dyes from a chemist in whose shop-window I had seen it carelessly lying. The exact time it had been there I am not prepared to say. The card has been in my possession about a year, hung against the wall of my usual sitting-room, but where no sun ever reaches it, although daily exposed to a bright light. The colours are on bits of silk ribbon, which appear to retain their brightness and purity perfectly up to the present time.

About six months since, I tinted some albumenized proofs with Mr. Bailey's aniline colours, folded them into a packet, which I put away into a dark drawer for safety. Examining these pictures from time to time, I find that they have not altered or faded in the least. The above-named are short periods of time, I willingly allow, for proving permanency; nevertheless, as far as the experiments extend, they are encouraging ones. I have not exposed these aniline colours to the trying ordeal of a blazing sun, neither do I consider the test altogether a fair one, seeing that many dyes, otherwise tolerably permanent, as well as certain natural colours in flowers, &c., do not stand this searching exposure without evidencing its bleaching powers. Such a proof of permanency would, probably, be even objected to by the possessor of a highly-coloured and valuable oil painting; at least, that would be my individual feeling about the matter.

The accumulated observations of many experimentalists being essential to the clearing up of existing doubts and fears with respect to the aniline tints, which are likely,, at the present time, to interest the minds of others besides myself, I would venture on requesting to be favoured with the experiences of those of your readers who may have given a more extended trial to the colours in question, especially with reference to their durability.

Heartily wishing your very useful periodical every success, I am, sir, yours very truly, Henry H. Hele.

Teignmouth, Devonshire, June 3rd, 1865.

[The enquiry on which Mr. Hele is engaged is a most interesting one, and we feel sure that it could not be in abler hands. We shall be glad if those of our readers who may have any experience in the matter will contribute it to the general stock of knowledge on the subject. We quite agree with Mr. Hele in the idea that paintings of any kind, in oil, water, or pastel colouring, ought not to be submitted to the action of a blazing sun as a test of their permanency.—Ed.]

Talk in the Studio.

New Dark Tent.—Messrs. Murray and Heath have called our attention to a new dark tent for field work, which they have designated "The Landscape-Photographers' Manipulating Box Tent." It is intended to carry inside all the necessary materials for work, not *in situ*, but so as to be very readily arranged. It has no loose pieces, and is erected or packed up in a few minutes. When packed up it is a box of something less than 3 feet long, 2 feet wide, and 1 foot deep. When erected for use it is capacious and convenient, well-lighted with non-actinic light, and well ventilated. The interior is admirably arranged, with a place for everything within reach. Simplicity, convenience, and efficiency are its leading features. Without directly trenching on the designs of those already in existence, it combines the good points of several of them in a satisfactory manner.

Photographs of the Duc de Morny's Paintings, &c.—We understand that Mr. England has just returned to London from Paris with a series of very fine negatives from the paintings, works of art, and articles of *vertu* of the late Duc de Morny, a commission to photograph which he had received from the Duchesse, from whom also he has received permission to publish the series. It is a high compliment that an English photographer should have been selected for this task, seeing that so many able photographers are resident in Paris.

The Photographer in the Hands of the Brigands.—The *Italia* of May 27th has the following:—"Ciardullo's band at length sustained a defeat on the 25th instant. The brigands, 30 in number, were so energetically attacked by a few carabiniers, that they hardly had time to take refuge in flight, leaving behind them two of their number, one killed, the other wounded. The brigands have still in their hands the prisoners in whose fate the whole country is justly so deeply interested. Had the carabiniers been less limited in point of numbers, the band might, perhaps, have been surrounded." The Naples correspondent of the *Temps*, writing on May 28th, states that our unfortunate countryman, captured by the banditti, was still in their power. He says:—"England, according to her well-known custom, is acting nobly in behalf of her unfortunate subject in the clutches of the brigand chief Ciardullo. An English frigate has anchored before Salerno; the consul, Mr. Bonham, has been at Eboli for the last five days, negotiating with the banditti through a priest. Ciardullo, under the impression that the English Government has authorised the consul to pay a large ransom, insists on £10,000 to release him. Under his dictation, the unfortunate prisoner writes despairing letters to Mr. Bonham. Whilst this negotiating goes on, the mobilised national guard are acting vigorously; they have had another engagement with the banditti, five men being killed on either side."

Photography and the Derby.—We understand that some successful photographs were obtained of the scene on Epsom Downs on the Derby Day. Mr. Herbert Watkins obtained some negatives, and Messrs. Hill and Saunders also obtained some. Of an instantaneous picture obtained by the latter, a morning paper says:—"It brings vividly to remembrance this part of the course as it appeared on Wednesday, at the moment preceding the start, when the crowd, after waiting patiently for hours under the broiling sun, almost everywhere exhibited an attitude of repose. The time was well chosen. Groups squatting awkwardly on the grass, or lounging in various postures against the barrier, are represented with admirable clearness. So it is, too, with the figures in the middle galleries, where the ladies seated under their parasols, and the gentlemen leaning over the balconies, or looking out through field-glasses on the heath, and the thousand other incidents of the scene, are depicted with a wonderful richness of detail. Wherever the crowd was motionless the photograph is admirable. This, however, cannot be said of those parts of the plate which represent the multitude in the betting enclosure, and the crowd on the top of the grand stand. The sea of hats and scarfs which is there represented seemed to have been in incessant motion, and the result is that they are represented in a blurred and confused manner. Upon the whole, however, this photograph conveys a very lively idea of the scene which it represents, and will supply to French sporting men an appropriate memorial of a triumph of which they may well be proud.

Stealing Lenses.—A correspondent says:—"Having read in your News of two or more robberies being committed in studios, by which the loss of cameras and lenses was sustained, I took the precaution, in building my new studio (which I have just completed), to have a small pane of yellow glass fixed in the wall of my dark room in such a position as to command a view of the whole of my glass house at the time that I am developing, &c., and it is so arranged that it looks totally dark to the sitter. Perhaps this hint may be useful to others, whose property is as likely to become the prey of the prowling thieves as that of those who have already suffered."

Reducing Intensity of Negatives.—A correspondent, Mr. Horner, says:—"Having seen in your paper enquiries, at various times, respecting the reduction of intensity in negatives, it may possibly be useful to know that repeated applications of cyanide will, to a great extent, effect that end. I have found such to be the case in my practice." The disadvantage in using cyanide arises from the danger of destroying the half-tones. The delicate half-tones are generally most readily attacked, and whilst the intensity of the negative is reduced, there is often a general loss of harmony.—Ed.

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To Correspondents.

Edmund G. Ganly.—Mr. Buxton's address we do not remember. Probably a letter addressed to him to the care of the Manchester Photographic Society will find him. 2. There is no especial work on Photography in India. Several articles on the subject appeared in our last volume, and there is a chapter on the subject in "Practical Photography," published by Negretti and Zambra. 3. We cannot advise on the wisdom of going to India as a professional photographer; we do not know sufficient of the prospects. 4. The cost of a complete equipment for portraits and views may vary from £10 to more than ten times that amount.

J. G.—A glass positive may be copied either in the ordinary manner, like any other picture, or, if well exposed, it may be copied in the camera by first obtaining a transparency from it, and then from the transparency a negative. The quality of the copy will of course much depend on the excellence of the original. If the original be a pale or over-exposed picture it will be very difficult to get a good negative from it by copying in the ordinary way; the plan of letting the light pass through it to form first a transparency and from that a negative will, probably, in such, answer best; but if the original be vigorous and well defined, a good negative may be obtained by copying in the ordinary way. It will be easy, with a little care, to light it so as to avoid reflections. The only arrangement the lens will require is a moderately small stop. 2. We cannot recommend the lens you mention; besides, it is probable that it could not now be obtained. 3. Some photographers use oilcloth, and some carpet on the studio floor; there is no special material for the purpose. 4. A grey background is best for general purposes.

St. Dennis.—There are two or three methods by which a surface of silver can be covered with gold; but the best is by electro-gilding. The details are, however, much too lengthy for insertion here. 2. We have not used either of the lenses you name, but should choose that by the English maker.

C. O. P.—The markings on your plates appear to be the result of partial drying before development. Similar markings sometimes arise from scum on the surface of the bath; this may, however, be easily seen by examining the solution. Methylated spirit in the collodion would not produce such a result. If, as you state, the plate just withdrawn from the bath and covered with the developer gives similar markings, it is very probably a floating scum on the surface, which is very apt to accumulate in hot weather, as the solution rapidly evaporates, and then, by washing up against the sides of the bath, acquires this floating scum on the surface.

George S.—Almost every painter has his own method of using oil colours. Some prepare a medium of their own, others use megilp, others Miller's Medium, some thin with turpentine and linseed oil. Megilp, which is most commonly used as a medium for oil colours in photographs, is made of drying oil and mastic varnish, which forms into a kind of jelly; it generally dries rapidly. 2. Sugar of lead, prepared for the purpose is used to aid drying. 3. The photograph may be prepared with a sizing of gelatine or isinglass, or with a preparation sold by Newman for the purpose.

C. Springham complains that it is not fair criticism to condemn an invention without pointing out the special fault or imperfection; and he thinks this is done by the "Old Photographer" in "Echoes of the Month," when he refers to the inventions shown by Mr. Springham at the last North London Meeting as "more ingenious than generally useful." In all matters of this kind, Mr. Springham must see that, without actual trial, an opinion only can be given. Our own recorded opinion was in favour of the inventions exhibited. The "Old Photographer," admitting their ingenuity, does not think them sufficiently useful to supersede the apparatus in use. To point out detailed faults (although no faults were alleged) would require much more space than we accord to the monthly reminiscences of our contributor, even if he were anxious to enter into particulars on a subject only calling for a passing remark. The fact that Mr. Springham does not know the name of the "Old Photographer," does not in any way alter the question either of the ingenuity or utility of the inventions in question.

C. C.—Almost any professional photographer could probably supply you; but you would have no difficulty at the house of Messrs. Marion and Co., or of the London Stereoscopic Company.

Failure.—Nitrate of silver, when dissolved in methylated spirits, in daylight, frequently becomes coloured of a reddish-brown tint, and finally deposits, after standing, a slight brown precipitate. No harm, however, results from this taking place. 2. According to your description, your collodio-chloride only contains 3 grains of pyroxyline to the ounce; we should have employed, of the same kind of cotton, three or four times that proportion. The cotton we used, by the maker in question, was made three or four years ago, so that we cannot tell that the sample you have used is the same. In speaking of arrowroot paper, do you mean that expressly prepared for collodion printing, or that prepared for ordinary photographic printing? If the latter, it would contain a chloride. The behaviour of the paper sent, when exposed, suggests that a salted paper may have been employed; but in any case there is a very insufficient body of pyroxyline, and, of course, a very attenuated layer of the sensitive compound. The paper prints slowly, and the result is wanting in vigour, although, with a good negative, we obtained a moderate print on a piece of the paper.

Silvea is anxious to know where he can get some first-class card and whole-plate portraits of private individuals to colour as specimens They must be well posed, brilliant, and cheap. We fear we cannot help him. Private individuals generally object to their portraits being sold as specimens, and first-class photographers naturally object to sell them. The best plan will be to purchase the most suitable published pictures; and surely the stock kept by such firms as Marion and the Stereoscopic Company ought to furnish sufficient choice. 2. The registration forms can be obtained at a penny each, at Stationers' Hall, or our publisher will forward you some on receiving stamps and a stamped envelope. 3. You may enter two or three pictures on one form.

The New Wide-Angle Landscape Lens.—Mr. Baynham Jones calls our attention to some printer's errors, which occur in his letter on this subject in the News of May 26. He says: "In the 21st line the full stop is placed after the word "way," instead of following the word ' perceive," thereby inferring that I was in doubt as to the amount of angle covered by the lens, which is certainly not the fact. In the last line of the second paragraph, for "shorter" read "sharper," and in the last line but one for "of" read "for," alluding, of course, to the size of view, not that of the lenses, which do not correspond in size."

P. W.—We were before under the impression, from their appearance generally, that the prints sent were toned and fixed. On receiving your last note, we tried the only print of those sent we could find, and as, from its horny dryness, and having been fingered, it repelled water, we immersed it in alcohol and water until it was well moistened. It is probable that in the horny repellant state the film was at first, the print might remain a long time in any solution without any action being apparent, as the solutions could not penetrate the film. We then immersed it in a bath of hypo and gold we had recently found to tone well, and, in a few minutes, it assumed a black tone. We know many authorities who hold that this toning bath, properly used, is quite safe; but we dislike it on theoretical grounds, as we fear the risk of sulphur toning. For collodion printing, both by the collodio-chloride and Wothlytype processes, we have succeeded, more or less, with almost all the forms of toning bath, but the bath of hypo and gold works best.

C. P. B.—You can obtain tracing paper of any stationer. The paper used by architectural draughtsmen, surveyors, &c., is the right kind of thing for attaching to the negative on which to trace a sky.

C. M. Major.—You will obtain the most perfect results in reducing from your negative by first producing a reduced transparency, and then from that a reduced negative; as, by this means, you experience no difficulty from the texture of the paper. Or you may take a print on opal glass, and then make a reduced copy from that in the usual way. We never received the former letter to which you refer.

W. H. Warnea.—Received: notice in our next.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Messrs. Harvey, Reynolds, and Co., Leeds,
Portrait of Serjeant Corbett.

Mr. Thomas Aldcroft, London Road, Manchester,
Photograph of Group of Ministers.

Mr. Wm. Howie, Lord Street, Southport,
Two Photographs from plan of Congregational Chapel, Southport.

Mr. and Mrs. Mouson, Bridge Street, Northampton,
Portrait of Lord Burghley.

Mr. Andrew Mellis,
Five Portraits of Miss Kate Saville.

Messrs. Pettitt, Brothers, 30, Paradise Street, Birmingham,
Portrait of Miss A. J. Menkin on Horseback, attended by Mr. W. H. Swanborough.

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ART PROGRESS IN PHOTOGRAPHY.

In dealing with a vague subject, there is a common tendency to deal vaguely; and perhaps few topics have been the subject of more unmeaning rhapsody, trite platitude, and indefinite commonplace, both on the affirmative and the dissentient sides of the questions discussed, then those which have been termed the art phases of photography. We do not complain of this, because it seems, as we have intimated, the inevitable tendency of a vague subject; and any discussion at all on the question, which brings it periodically under the attention of photographers, must, if it does not convey information, at least suggest thought, on a subject which, however ill understood, imperfectly defined, and at times unfairly treated, is after all one of vital importance and interest.

A paper read by Mr. Wall at the last meeting of the South London Photographic Society, which appears on another page, is not free from the vagueness to which we have referred; but what it lacks in definiteness, it supplies in being comprehensively sweeping. The writer finds the productions of photographers marked as a rule by great technical short-comings, and by an *entire absence of æsthetical excellence;* and he finds that certain artistic qualities "have been systematically ignored by the photographic community—writers, teachers, students, and masters alike." The efforts made in pictorial progress he admits to be every year more numerous, but they are "feeble attempts rather than promising achievements," and he adds, hopelessly, "Who can wonder at it? Where can the most ardent of photographic art-students find help and encouragement?" It is the evil of all exaggerated statements that nobody believes them; the over-statement is incredible, and is rejected altogether without examination, no effort being made to find the grain of truth in the bushel of inflated verbiage. Mankind are equally apt to refuse advice from those who couple it with an affront, and to refuse to serve God if the devil bid them.

We fear that the paper in question is likely to fail in effecting the good it is doubtless intended to produce, from causes analogous to those to which we have just referred; and as we lose no opportunity of urging attention to art culture, notwithstanding that it is systematically ignored by the "photographic community—writers, teachers, students, and masters alike," we once more commend to our readers a thoughtful consideration of the charges made against photographers generally, of ignorance and disregard of art. In doing so, however, we must dissent from the position suggested, although put interrogatively, that the ardent art-student is beyond the pale of help or encouragement. The sources of art information, *quoad* art, are open alike to the art-student of photography, the art-student of painting, and all other art-students. Art in relation to photography is not distinct from art in relation to painting; the principles of pictorial representation are the same for each, although their embodiment may be different in each, and whilst the source of instruction in the general principles are alike open to all students, the technical means of the embodiment of the general art information acquired becomes the duty of technical instructors, journalistic and otherwise.

The sweeping denial of all æsthetic excellence, and by such denial the entire exclusion, "as a rule," of existing photographs from the domain of taste, needs no comment. We are in no way concerned to point out the folly of a statement which charges the journals with systematically ignoring the art phases of photography. From the time, upwards of half a dozen years ago, when the Photographic News initiated a system of art-instruction, by the publication of the able articles of Mr. Lake Price on Composition and Chiaroscuro, down to a period since Mr. Wall himself had completed or discontinued the art suggestions, of which he has written so much in our own and contemporary pages, the journals are themselves the best refutation of this statement. No one can, however, be angry with a speaker who so candidly, by implication, includes himself in a general condemnation amongst photographic art writers who have systematically ignored art in photography. It may be urged by the unreasonable that a general onslaught is less instructive than a clear statement of specific faults and definite remedies. This may be quite true; but, to be definite, would also be more difficult. But even if photographers knew the faults to avoid, and the excellences to aim at, they must have the much-contemned knowledge of process, and possess the slighted manipulative skill. "If to do were as easy as to know what were good to do, chapels had been churches and poor men's cottages princes' palaces." The executive skill must be attained, and, as Mr. Sebastian Davis well pointed out, scarcely a single improvement in method or process has been sought or attained by the most enthusiastic scientific student of photography, which has not had for its end the more certain achievement of artistic results, so far as these results depend upon technical possibilities.

Indeed, much of the rating which photography periodically receives from friends and foes seems to arise from a misapprehension of the limitations of the term art, and the relation of photography thereto, and from that misapprehension of the real relation of technical excellence to artistic result which arises from the want of technical knowledge. In the first place, whilst photography, as we have often shown, is unquestionably one of the fine arts, it cannot enter the lists, æsthetically, with painting; it is incapable of attempting high or imaginative art; its technics prevent it. The plasticity of the materials of the painter has scarcely any limit in giving embodiment to the liveliest imagination of the artist who can wield them. But, much as photography can do, it has inexorable limits. "Thus far shalt thou go, and no further," meets the artistic photographer at each effort to body forth his conceptions by means of camera and lens. But we hesitate not for one moment to assert that, considering each in relation to the limits of its appliances, photography has, as a whole, produced quite as worthy work as painting. The absence of the highest artistic results of which the art is capable is, we believe, less, or certainly not more, true of photographic exhibitions than of any other art exhibitions. The highest æsthetic excellence in any art is given to few to attain, whilst the highest technical excellence is always within the reach of industry. We have been especially struck with this in going through the various exhibitions of paintings now open in London. A thoughtful writer makes a similar remark in relation to the present exhibition of the Royal Academy. "Here," he says, "in these rooms, there are nearly a thousand pictures, many of them exhibiting a high degree of skill, both in drawing and colouring—but in colouring particularly. There are five hundred artists who can paint a Turkey carpet, or an old oak chair, to perfection; but there are very few indeed who have any perception for the soul and poetry of the work. The best manipulation is often expended upon the feeblest designs, utterly wanting both in idea and purpose. The rooms in Trafalgar-square are haunted by the ghosts of ideas. There are hundreds of well-painted nothings." And such a statement will probably always be possible; there will be hundreds of well-painted nothings, and hundreds of well-photographed nothings; but good painting and good photography, technically, are not the less important studies. One of the ablest art photographers of the day has only failed to secure a position in the highest ranks, because he has failed to master thoroughly the lowest forms of technical excellence; and others, with aspirations after art photography, have dropped by the way because they failed, for want of steadiness of purpose, to master these lowest forms of excellence at all. The art science is young as yet: great as its progress has been, it has not yet, even technically, attained the position of an exact science. There remains much to be done in the way of "process," &c., before certainty and many other good qualities are obtained. Nevertheless, to most men of ordinary intelligence, that technical excellence is possible, which is the necessary qualification for artistic excellence. Our advice to the art student is to study art as much as he can, neglect no opportunity of cultivating his feeling for art and his knowledge of it; but avoid, as a pestilence, that unhealthy condition of mind which contents itself with vague undefined yearnings after æsthetic excellence that never find embodiment in some good honest pictorial work, only to be achieved by a perfect understanding of, and mastery over, the despised technical excellence.

In the discussion which ensued on Thursday night there was one practical suggestion, which we hope to see embodied. Mr. Blanchard said that he had for some months been seeking a fitting occasion for suggesting to the South London Photographic Society the formation of a library of reference for photographers. We think the idea a most important and valuable one. The nucleus he suggested was to consist in standard works on art principles, amongst which the eloquent series of works on art by Ruskin were to take first place. The idea might, and should, be rapidly extended. Such a library should contain every valuable work of photographic reference in this or other languages, and should contain the bound volumes of the various photographic serials from the beginning. Works on art, and works on chemistry, would be not less necessary and valuable. Without entering into details here as to ways and means, or modes of management, we think the idea as possible to work out as it is desirable to entertain. We commend it also to other societies as a project worthy of the attention of every one of them. Mr. Leake's excellent suggestion is one we have often mentioned. We should be delighted to see some educational facilities, both of an artistic and scientific character, established in connection with photography. We wish that were as possible and practicable as the reference library. About the latter we see no difficulty, and hope to be able to announce at the commencement of another session that the first steps are taken to establish not one, but many, collections of volumes for the use of photographic students.

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A SILLY PIECE OF GOSSIP.

It is of Charles Lamb, if we remember rightly, that the story is told, that having on one occasion spoken of some one as a "naufragous villain," he was subsequently asked what the term meant: he said he "scarcely knew, but thought it a good word to throw at a man's head." It is not an uncommon thing in the world to find all the animus to fling charges at a man's head, with every care taken that they shall be indefinite or difficult to bring to an issue. Sometimes the indefinite class of vermin, known as slanderers, are run to earth more certainly than is calculated upon. The meeting of the Photographic Society on Tuesday night was the scene of perhaps as singular a case of hunting down and running to earth a piece of scandal as ever occurred at any assemblage of educated men. Although the matter might have been important in its issues if it had fallen into hands less prompt, honourable, and straightforward than those of Mr. Glaisher, it is nevertheless one so thoroughly personal in character, that we should have preferred to pass the matter without notice, if its publication depended on us, and if silence were not liable to misconstruction. The matter having been publicly bruited, however, demands one or two words of comment, and further explanation.

Mr. Glaisher, vice-president of the Society at the meeting in question, stated from the chair that he had recently been in the receipt, from three different gentlemen, of a very voluminous correspondence. From motives of forbearance he appeared unwilling to mention their names, and in his further explanation he referred to his three correspondents as A, B, and C. The purport of this correspondence, from which he only read extracts, was, he said, to insinuate that the council of the Society had been doing its work very imperfectly, that the editor of the *Journal* had not been doing his duty at all, and that Mr. Wharton Simpson, editor of the Photographic News, had been doing the work of all of them! From the further explanation which followed, it appeared that this correspondence had been initiated by one of the gentlemen—we presume A—who had felt aggrieved at the comments in a recent leader in the *Journal* of the Society, which leader, on the authority of another of them—we presume B—he, A, stated to have been written by Mr. Simpson. We cannot undertake to follow these Roman letters through all their involutions—it is lucky they were not indicated by figures—it would have been so suggestive of the convict system! And we shall not, therefore, attempt to indicate the part played respectively by A, B, or C. Suffice it to say that they seemed to have but one purpose, and to act, as tools or workmen, to a common end.

The object, as we have said, of this piece of gossip or slander—for that which begins with the one often ends with the other, so that "each seems either"—appeared to be to insinuate that Dr. Diamond, the secretary of the Society, and editor of its *Journal*, was either incapable or unwilling to do his work; that the committee appointed to take charge of the *Journal* entirely neglected their work; and that the editor of the Photographic News, not finding sufficient to engage his energies in the conduct of a weekly photographic journal, in the practical experiments described by him in papers read at societies, in the correspondence with foreign scientific journals to which his name frequently appears, and in occasional contributions to miscellaneous literature, amused his leisure with controlling the management of the Society's *Journal*, writing its leaders, &c., as a labour of love. Great as is the compliment implied in this, his modesty and truth alike compelled him to disclaim it. But there was a motive suggested for his undertaking this work of supererogation; writing in the Society's *Journal* would give him an opportunity of expressing opinions which he would be afraid to express in his own pages. Afraid! Of what, we wonder, or of whom? His name in this matter had no need of the cloak implied in the use of any letter of the alphabet from A to Z; and he might have added to the brief categorical answer which he gave to Mr. Glaisher's question that he had never, during twenty years' connection with literature, written a line to which he would have hesitated to put his name.

Foolish as was the charge against the Society's *Journal*, the Committee, and Dr. Diamond, Mr. Glaisher felt that a very unhealthy state of things might arise out of such slanders, and although the communications were marked "private," he, as a man of honour, felt that he could not be made the confidant of such slanders without refuting them fully and openly. He accordingly put himself in communication with every one who could afford a scintilla of evidence on the subject, and found that each accumulating proof more surely confirmed his own convictions that the charges were false, and that the false charges made privately must be disproven publicly. Hence the explanation on Tuesday night, when, to make assurance doubly sure, he concluded his summary of evidence by very courteously asking Mr. Simpson if he had written the article in question, or any other recent article in the Society's *Journal*. To this he received a courteous but most emphatic reply, to the effect that Mr. Simpson had not written that or any other article in the Society's *Journal* this year, except such as had his name attached; and that although he had occasionally in years gone by contributed practical articles, he did not remember that he had ever contributed a critical article, or a comment upon any person or thing, to its pages.

Why such an attempt to damage Dr. Diamond's reputation, or oust him from the position he fills so honourably, has been made, it is not for us to say. Why our name should be made to aid such an attempt we may be able to conceive, but it is unnecessary to explain. The circumstance that we have, during the years it has been our privilege to call Dr. Diamond friend, aided him occasionally in his editorial duties by the contribution of practical articles and items of intelligence—in short, reciprocated literary courtesy, in the exercise of that *esprit de corps* which prevails amongst respectable journalists—may possibly have suggested the fabrication in question; but we feel bound, in justice to Dr. Diamond, to add to the denial already given, our emphatic word that the suggestion of our having exercised any editorial or other control over the *Journal* is a baseless untruth. We should esteem it a severe loss to the Society if, through any trumpery machinations of this kind, he were induced to resign. His name is one of the oldest and most honourably associated with photography and the Photographic Society. With an intimate practical and scientific acquaintance with every branch of photography; with an intimate personal acquaintance with all its historical phases; with high reputation and familiarity with almost every branch of art, science, and letters; with the habits and instincts of a gentleman, and a degree of personal urbanity rarely met with, he is essentially the fit representative of the Photographic Society of England, and we esteem it a most deplorable thing that any attempt should be made to assail his position in connection with the Society.

We have a word or two more to add in connection with this matter, and we do it with much reluctance. A mystery, if cleared up at all, should be thoroughly cleared. Some of the names represented by A, B, and C, were freely canvassed after the meeting, and we make no conjectures, and break no confidence, in mentioning those talked of: we should be delighted to learn that the common talk in the room was error. The gentleman aggrieved by comment on his paper—it is immaterial to the present purpose what the character of the article or comment—was Major Russell; the other, his authority, we presume, for the charges in question, was stated to be Mr. Dawson, lecturer on photography at King's College; the third, and apparently least prominent and least spoken of, was a respectable tradesman in connection with photography: as we fancy that he was misled and made use of in this matter, we shall not mention his name. We make no comment, and attribute no motives, but leave the subject by suggesting that wherever an end is to be gained which will not bear dealing with openly and straightforwardly, the end is bad, and the effort to gain it will, nine times out of ten, terminate, as it ought to do, in failure and confusion.

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PHOTOGRAPHIC EXHIBITION IN NORTH LONDON.

Our readers are already aware, from prior announcements, that an Exhibition of Arts and Sciences will be opened during August next, in the North-eastern District of London, the photographic department having been placed under the charge of the North London Photographic Association. In order to afford time for the proper allocation of space, and to make other desirable arrangements, it is necessary that all applications for space should be received by the end of the present month. As all exhibitions of this kind tend materially to the advancement of the art, and to the development in the public mind of a proper appreciation of it, we hope that photographers will find it their interest and pleasure to contribute freely to the forthcoming exhibition. We understand that an excellent position will be allotted to photographers, and that medals, both for good pictures and meritorious apparatus, will be awarded. We subjoin the conditions for the guidance of exhibitors.

That special screens or fittings for photographs may be used by any exhibitor at his own cost, subject to the approval of the committee.

Carte de visite portraits will be exhibited, provided they do not exceed twenty in number from any one exhibitor, and in frames containing not more than four square feet.

Coloured photographs will be admitted.

The committee request that cabinet or other small pictures be mounted in sets of four, six, or more in each frame.

The committee have the power of rejecting any pictures or apparatus that may be sent for exhibition.

All expenses of transmission to or from the exhibition must be borne by the exhibitors, and the committee cannot hold themselves liable for breakage or damage.

All exhibitors of apparatus must provide suitable counters and fittings for the same at their own cost.

That no application for space can be entertained after the 30th of June.

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TO DUBLIN AND BACK, WITH A GLANCE AT THE EXHIBITION.

BY J. WERGE.

The bell rings, a shrill shriek, puff, puff goes the engine, and we dart away from the station at Euston Square, provided with a return ticket to Dublin, issued by the London and North Western Railway, available for one month, for the very reasonable charge of £3, first class and cabin; £2. 7s. 6d. second class and cabin; or forty shillings third class and steerage, viâ Holyhead. These charges include steamboat fare and steward's fee. The Exhibition Committee have made arrangements with the railway companies to run excursion trains once a fortnight at still lower rates; twenty-one shillings from London to Dublin and back, and from other places in proportion. This ticket will be good for a fortnight, and will entitle the holder to another ticket giving him two admissions to the Exhibition for one shilling. With the ordinary monthly ticket, which is issued daily, it is quite optional whether you go by the morning or evening train, but by all means take the morning train, so that you may pass through North Wales and the Island of Anglesea in daylight. Passing through England by Rugby, Stafford, Crewe and Chester, nothing remarkable occurs during our rapid run through that part of the country. But, an "Irish Gentleman," a fellow traveller, learning our destination, kindly volunteered to enlighten us how we could best see Dublin and its lions in the shortest possible time, and advised us by all "manes" not to "lave" Dublin without seeing "Faynix Park," and taking a car drive to Howth and other places round the "Bee of Dublin." Accordingly we agree to take his advice; but as our primary object in visiting Dublin is to see the Exhibition, we will first of all attend to that on our arrival in the Irish capital; and if, after that, time will permit, the extraneous lions will receive our attention. First of all, we must describe how we got there, what we saw on the way, and what were our impressions on entering Dublin Bay.

As we said before, nothing particular occurred during our journey through England to excite our attention or curiosity, but on passing into Wales—Flintshire—our attention is at once arrested by the difference of the scenery through which we pass. Soon after leaving Chester we get a sight of the river Dee on our right, and continue to run down by its side past Flint, Bagillt, Holywell and Mostyn, then we take a bend to the left and skirt a part of the Irish Channel past Rhyl, Abergele, and Colwyn to Conway, with its extensive ruins of a once vast and noble Castle, through, under, and about the ruins of which the double lines of iron rails twist and twine and sinuously encoil themselves like a boa constrictor of civilisation and demolisher of wrecks, ruins, and vestiges of the feudal ages and semi-barbarisms. Our iron charger dashes up to the very walls of the ancient stronghold, close past the base of a tower, and right under the hanging ruins of another, which is in truth a "baseless fabric," but no "vision," for there it is suspended in mid air, a fabric without a base, holding on to its surroundings by the cohesive power of their early attachments. We rush into the very bowels of the keep itself, snorting and puffing defiance to the memoried sternness of the grim warriors who once held the place against all intruders. Any one who has not had an opportunity before of visiting North Wales should keep a sharp look-out right and left, and they will get a peep at most of the principal places on the route: the Welsh mountains on the left, their summits illuminated by the sun sinking towards the west, and the mass of them thrown into shadow in fine contrast.

Now we are at Penmaenmawr, that pretty little watering place, with its neat-looking houses snugly nestling in the laps of the hills, and we pass along so close to the sea, we can feel the spray from the waves as they break on the shore.

Passing Llanfairfechan and Aber we are at Bangor, and almost immediately afterwards make a dive into the long, dark chamber of the Tubular Bridge, with a shriek and rumbling rattle that is almost startling. In a few seconds we are out into the daylight again, and get a view of the Straits of Menai; and on the right-hand side, looking back, get an excellent sight of the Tubular Bridge. At the moment of our passing a ship in full sail was running before the wind through the Straits, which added considerably to the picturesque beauty of the scene. On the left a fine view of the "Suspension Bridge" is obtained. We are soon past Llanfair, and across that bleak and desolate part of the island of Anglesea, between the Menai Straits and the Valley. Arriving at Holyhead we go on board the steamer which is to carry us across the Channel to Dublin. The boat not starting immediately, but giving us a little time to look around, we go on shore again, and saunter up and down the narrow hilly streets of Holyhead, listening in vain for the sound of a word spoken in our mother tongue. Not a word could we hear, not a word of English could we get without asking for it. The most of the people can speak English with a foreign-like accent, but you seldom hear it unless you address them in English. Even the urchins in the streets carry on their games and play in the Welsh and unintelligible sounds resembling language.

We also had time to examine the stupendous breakwater which the Government is building at Holyhead to form a harbour of refuge. The wall is a mile and three-quarters in length, and of immense thickness, in the form of three terraces, the highest towards the sea. At one place we noticed that the solid slaty rocks were hewn and dressed into shape, and thus formed part of the wall itself, a mixture of Nature's handiwork and the work of man.

Time to go on board again, and as the wind was blowing rather strong, we expected to have rather a rough voyage of it; and sure enough we had, for we were scarcely clear of the sheltering kindliness of the sea wall and the "north stack" till our vessel began to "pitch and toss," and roll and creak, and groan in agony; and so highly sympathetic were we that we did the same, and could not help it, do what we could. Strong tea, brandy and water, were all no use. Down we went, like prostrate sinners as we were, on our knees, with clasped hands, praying for the winds and the waves "to be still," but they did not heed our prayer in the least, and kept up their inhumane howling, dancing, and jumbling until, by the time we reached the middle of the Channel, we began to think that the captain had lost his course, and that we were somewhere between Holyhead and purgatory, if not in purgatory itself, being purged of our sins, and becoming internally pure and externally foul. But we discovered that we, and not the captain, had lost the course and the even tenour of our way, for we fancied—perhaps it was only fancy—that we could hear him humming snatches of old song, among them "Oh! steer my bark to Erin's Isle!" and soon the mountains of Wicklow are in sight. As we near, and get under the lee of the land—for it was a stiff "sou'-wester" that bothered us—our sensations and feelings begin to improve, and we pick ourselves up out of the mire, and turn our eyes eagerly and hopefully towards the Emerald Isle, and Dublin Bay more particularly.

As we approach the Bay the Carlingford Hills can be seen on the right, and a little more southwards Lambay and Ireland's Eye. The latter island is rugged and precipitous, seaward, in the extreme — a barren and desolate-looking spot, possessing an unenviable notoriety on account of the murder of a lady by her husband having been committed there a few years ago: Howth, the light-house, and the Bailey Rock, where the Queen Victoria steamer was wrecked, now attract our attention. And, as nearly as we can remember, these are the most striking features on the north side of the Bay. On the south the Harbour of Kingstown is distinctly visible, and we saw the mail steamer which crosses from Holyhead to Kingston, a distance of 60 miles, in three and a half hours, blowing off her steam. By paying a little extra you can cross in the mail steamers, if you wish, but it is not worth while paying the difference, as the ordinary steamers cross from Holyhead to Dublin in about five and a half hours. All round the south side of the Bay we could trace the Kingstown and Dublin railway, which is the oldest line but one in the United Queendoms of Great Britain and Ireland. An obelisk commemorates the visit of the last of the four Georges to Ireland in 1821. Right over Kingstown the Killinny Hills are to be seen, and all along the water line the Bay is studded with pretty little villas, and the scene is truly beautiful. If possible, arrange your entrance into the Bay of Dublin in the early morning, for then the sun, rising in the east, lights up the subjects to the very best advantage, and throws a charm about them which they do not exhibit at any other time of the day. By waiting at Holyhead for the early morning boat you can easily manage this. But now we are at the North Wall, and on landing are besieged by carmen to have a "rowl," and jumping on to one of those light, odd-looking, jaunting cars which are one of the institutions of the country, we are "rowled" up the North Wall for nearly a mile, past the Docks, over the drawbridges and past the Custom House—a large stone building, too large for the business of the port—along Carlisle Bridge, down Westmoreland Street, past the Bank of Ireland, once the Houses of Parliament, and up Dame Street, leaving the College on our left, and passing King William's statue, representing a mounted Roman with *gilded* laurels and ornamental toga, we arrive at Jury's Hotel, a commercial and family house of superior arrangements which was well recommended to us before we left London; and here we rest.

(*To be continued.*)

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ON THE APPLICATION OF PHOTOGRAPHY TO THE CONTINUOUS SELF-REGISTRATION OF MAGNETIC AND METEOROLOGICAL PHENOMENA, AS PRACTISED AT THE ROYAL OBSERVATORY AT GREENWICH.

BY THOMAS W. BURR, F.R.A.S., ETC.*

Among the numerous applications of the beautiful art-science of photography, there is probably not one that can compare in utility with the automatic registration of natural phenomena, by which a perfect and unerring record is obtained of manifestations that would otherwise be altogether lost, or if registered at all, it would only be imperfectly done, and this with an expenditure of human labour amounting to drudgery. Such results are, however, eminently unobtrusive in character, and for thousands who admire the beauty of photographic delineations of the persons they love or esteem, the exquisite scenery of our own or other lands, or the glories of architecture, sculpture, or painting, we must count only a few individuals who comprehend and appreciate the ceaseless working of the photographic record of the magnetic and meteorological instruments at the observatories of Greenwich, Oxford, and Kew; the daily portraiture of the solar spots at Kew, Cranford, and Ely, and the delineation of the lunar disc and other occasional photographic operations, connected with astronomy or physics, carried on by a few devoted followers of science.

A visit made by one of your late officers to the magnetic department of the Royal Observatory at Greenwich interested him so much that he desired to bring the subject before you, and requested me to undertake the task, to which I agreed, and at the earliest possible time proceed to redeem my promise. I may perhaps be allowed to explain that the reason for such application to me was simply his knowledge that, as an amateur astronomer and lecturer on that science, I had taken a peculiar interest in the history and instruments of the Royal Observatory, and for the purpose of my lectures had accumulated a considerable amount of literary and pictorial matter, illustrative of the buildings and their contents, in which object I have from time to time been kindly assisted by Mr. Airy, the Astronomer-Royal, and received every attention from Mr. Glaisher, Mr. Main, and other gentlemen now or formerly connected with that national establishment.

At the risk of being a little tedious in my paper, I think it most desirable to commence with some slight account of what it is that requires to be observed, the instruments used for such purpose, and the ordinary mode of making the observations prior to the introduction of photographic registration.

Most persons are familiar with the directive property of the magnetic needle, but all may not be aware that this instrument does not always point to the true north, but in various other directions at different places, and that even at any one place such variation is not constant, but differs at different times. Thus in London, for instance, nearly 300 years ago, in the year 1580, the needle pointed 10° 15′ E. of the true north; about 1650, rather more than 200 years since, it had returned and coincided with the astronomical meridian, after which it moved westward, attained its greatest deviation of 24° W. about 1818, and is now slowly returning to the north, its present error being 20° 30′. Besides this steady alteration of long period, there are much shorter regular variations, some of them being diurnal, others annual, and some coincident with the solar-spot period of about 10 years. There are also sudden and violent irregularities, known as magnetic storms, which occur simultaneously all over the globe, and which are probably connected with auroræ, or sudden alterations of the solar surface. It is to the researches and labours of the late Professor Gauss, of Gottingen, that we are indebted for our principal knowledge of the subject, and to his exertions it was due that the British and other governments, about 35 years ago, fitted out expeditions to various parts of the world, to establish magnetic observatories for a certain number of years, some of which were subsequently continued in activity.

About 1837, the Astronomer-Royal became impressed with the importance of this department of science, and anxious that observations on it should be carried on at our national observatory. Accordingly, at his request, an additional piece of ground was enclosed in the observatory domains, and in the following year the magnetic observatory erected. It is built of wood, and fastened with wooden pins, the metal iron being carefully excluded, except in the case of a portion of a stove and those parts of the clocks and instruments where it is absolutely necsssary. The position of the building is about 170 feet from any other erection, and it is in the form of a cross, originally 40 feet in each direction by 12 feet wide and 10 feet high, as shown in the plan of observatory and grounds which I place before you, such plan being a beautiful photographic reduction of a larger plan with which I have been favoured by the Astronomer-Royal. The northern arm of the cross has lately been lengthened 8 feet. From the exterior of the observatory the building is easily recognized, as in front is placed the tall mast used to collect atmospheric electricity and conduct it to the various pieces of apparatus placed in the window of the northern arm of the building. The remainder of this arm forms the computing room of this department of the observatory. The instruments are placed in the remaining three arms of the observatory, and, as to the magnetic department, are three in number. The general direction of a magnet may, in accordance with the laws of mechanics, be resolved into two or more forces acting in different directions, and the instruments used are designed to ascertain the variations from time to time, first in the direction of a needle, free to move in azimuth (that is, E. or W. with regard to the meridian); secondly, the variations in the dip or vertical plane; and, thirdly, in the intensity of its horizontal force. The declination magnetometer is used for the first purpose, viz., to measure the variation, or, as it is now termed, the declination of the magnet, and the incessant alterations which are going on in this element. The instrument is placed in the southern arm of the cross-shaped building, and consists of a massive bar magnet two feet long, carried by a stirrup suspended by silken threads with as little torsion as possible, and surrounded by double gilt boxes, having holes covered with glass for the observations, to avoid currents of air, and an oval copper bar or damper to lessen the vibration. At one end of the magnet is a frame carrying a cross of cobwebs, and at the other end a lens, which renders the rays from the cross parallel. In the centre of the room is a transit theodolite, by means of which, directed to the stars, the true meridian can be ascertained, and the readings of the direction in which the cross on the magnet is seen through the lens will give the amount of the declination at the times of observation. The cross is lighted either by a reflector in day-light or a lamp at night, as may be necessary for the purpose.

The dip or balance magnetometer occupies the western arm of the cross building, and, as its name implies, measures the angle formed by a magnet freely suspended on knife edges and at liberty to move in a vertical direction. The dip, like the other magnetic elements, is in a state of constant change. At London, in 1773, it amounted to 72° 19′, and is now about 68°. As you are aware, when we travel northward, the dip increases until in certain parts of the earth, the needle becomes vertical, and these places are called the magnetic poles. Sir James Clarke Ross reached one of these points in latitude 70° 17′ 5″ N. and longitude 96° 40′ 45″ W. in the year 1831; so that you see the magnetic poles are by no means coincident with the poles of the earth's axis. In all ordinary suspended magnets, the dip is counteracted by an increased weight at the other end and in the balance magnetometer which is placed nearly at right angles to the magnetic meridian this inclination is nearly counterpoised, the object being not so much to determine the absolute dip, which is done by separate instruments at stated times, as the variation in the vertical force. In order to measure this change, which requires much more delicate means than the variations of the declination magnetometer, a small plane mirror is attached a little out of the centre of the bar, which reflects the divisions of a scale fixed to the wall of the room, and these reflected divisions are observed with a telescope fixed near the theodolite, the motion of the magnet having been thus much magnified.

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* Read at a meeting of the North London Photographic Society, on June 7, 1865.

The remaining element, or the horizontal force of the magnet, is measured by the third instrument contained in the eastern arm of the room, and called the bifilar magnotometer. It consists of a magnetised bar, like the other instruments, which is suspended by two parallel sets of silk threads. If the strings and the magnet were in the same vertical plane the whole system would remain at rest; but the force of torsion is ingeniously brought into play to measure the horizontal force of the magnet. For this purpose, the suspending skeins of silk pass under two pullies attached to a plate turning on a graduated circle with much friction, by moving which, the magnet suspended from it is twisted out of the meridian to a position nearly at right angles with it. The force of torsion is, therefore, now acting antagonistically to that of the magnet, which endeavours to regain its normal bearing; and as the torsion force is constant, and that of the magnet subject to ceaseless variations, the magnet is always taking up fresh positions, and these angular changes can be connected mathematically with the forces producing them, and the share of the magnetic force in them deduced by calculation. The bar carries a small mirror, as in the last-described instrument, by which the reflection of a fixed horizontal scale is observed in another telescope precisely as with the balance magnetometer.

(To be continued.)

A FEW THOUGHTS ABOUT PHOTOGRAPHIC ART PROGRESS.

BY ALFRED H. WALL.*

"THIS evening, by particular desire," as they say in the play-bills, the subject for discussion is to be the art progress photography has made during the twelve months which have elapsed since our last annual meeting. In reading the opening paper I shall strive not to occupy too much time, and I intend to confine myself to some few remarks as to what I think the best mode of estimating that progress, and the direction it is most desirable it should take in the future.

The real progress of all true fine arts is both technical and æsthetical. I therefore propose that we consider photographic progress in either of these directions separately. Before doing so, however, it would be well, perhaps, that we should consider how widely different—although intimately associated—the technical is from the æsthetical in art.

The word *technical*, however applied—whether to modes of thought or modes of work, to the scientific or to the mechanical—indicates things common only to some one art or kind of art. In imitative art technical progress is governed by rules and principles capable of ocular demonstration. Art excellence, in a technical sense, is estimated more or less highly according to its rareness.

The word *æsthetic*, on the other hand, is associated with the instincts, feelings, and sentiments common to our nature, and is therefore purely speculative, being only recognized in intellectual and emotional effects and causes. Æsthetic progress is governed by the feelings of the artist. Art excellence, in an æsthetic sense, is estimated by the character of the thoughts and emotions of which it is creative.

To illustrate these definitions—in giving which I trust I shall not be thought presumptuous or impertinent—let us conceive a grand piece of music played on the same instrument by two different performers. The one performer renders every gradation of sound, however subtle, with rigid accuracy; the most educated ear cannot detect a falsely-played or unduly emphasised note, and, judging from a purely technical or scientific point of view, it seems that nothing could have conveyed a more just idea of the composer's artistic genius. The lover of music is charmed with the great knowledge, skill, and experience the musician has thus evinced, but his feelings are unmoved, his imagination idle. The second musician next approaches the instrument and repeats the performance. At once we realize a vast difference. The cold loveliness unveiled by the skilful hand of the first musician seemed that of a corpse, but now the beauty lives, thinks, speaks; the imagination is appealed to, the human poetry within us—"the child's heart within the man's"—awakens, and we listen with brightened eyes and glowing hearts. It is no longer the composer's scientific skill and knowledge, it is no longer the player's technical ability, which fills our thoughts; the very soul of a great artist is in communion with our own, and we listen absorbed, feeling as he felt, we think as he thought, and in the degree in which his thoughts and feelings were noble and elevated are we wiser or better men. It is so in every great work of art, whether it appeals to the eye or to the ear; and hence this sympathetic influence is what we look for as the loftiest and most important of all artistic qualities, taking precedence of mere technical excellence, and demonstrating the real value and rank of that branch of the fine arts with which it is associated.

Turning from these definitions thus illustrated to photography as an art, we find its present productions marked, as a rule, by great technical shortcomings and by an entire absence of æsthetical excellence. Those technical qualities which owe their existence to optical and chemical causes are, it is true, in a high state of perfection, and are very beautiful; but other not less technical, although artistic qualities, by which the shortcomings of art's imitative functions and its power of conveying thought and feeling are so vastly increased, have been systematically ignored by the photographic community—writers, teachers, students, and masters alike.

It is true that this photographic society and that of Edinburgh have, from time to time and at long intervals, given forth technical papers and discussions on questions of artistic value. It is true, also, that the editors of the two principal photographic serials occasionally place before their readers short technical papers on artistic questions, advanced upon authority more or less weighty or questionable; but these are so few as to be exceptions proving a rule.

Mr. Mudd humourously satirised the real state of things in this respect when, in a supposed dream of the future [*ante* page 212], he showed coming photographers still dealing with their *art* as a branch of physical science, and still overlooking the great fact that, as imitative art, its real progress must be sought in the very same paths which conduct other imitative arts towards perfection. Photography is no longer the mere producer of scientific curiosities is no longer a mere mechanical manufacturer of vulgar and tasteless portraits, &c.; but also aspires to the production of *pictures* which shall interest and instruct by their truthfulness and their beauty. The efforts made in this, the true upward and onward direction, become every year more numerous, but they are, as a rule, the efforts of men wanting in elementary knowledge and experience—they are feeble attempts rather than promising achievements; and who can wonder at it? Where can the most ardent of photographic art-students find help and encouragement?

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* Read at the annual meeting of the South London Photographic Society, June 8, 1865.

The journals are, as ever they were, full of mere baths and processes, of frivolous novelties and experiments, conducted purely for the sake of experimentalising or speculations, indicating the feverish restlessness of those who yearn for the right kind of advancement, but are not clear as to the path in which it must be sought. The societies are governed by men of science; men who fight shy of everything imaginative as dangerous to that coldly-logical investigative spirit which is essential to success in all branches of science; men who regard photography as opticians or chemists, but not as artists; and who regard with disfavour, or tolerate with impatience, discussions and papers having purely artistic bearings.

It is time that photographers should recognise these truths; time that a revolution was brought about, as sooner or later it must be. Photographers cannot long go on in the old, old ruck of baths and processes. There must come a time when these things will be exhausted; when every conceivable modification of every conceivable process, tried over and over again, has been tried for the last time; when there is not room even for the most inconsiderable of mechanical suggestions or trade novelties.

Even now, how are we progressing? We are multiplying the means of doing well that which has already been well done. It is thought a great hit when, by going to the right, we reach the very spot we before got to by going to the left. How many processes have we now by which results equally fine are to be and have been obtained? Their name is legion. And are we to stagnate in this way? Are we to continue going round and round after the same old tail, when there is so wide and noble a field of promise and progress full in our sight? With time to spare in our societies, and space to be found in our journals, why should one-half of technical excellence, and that the better half, be sacrificed to the other part, which is already so well cultivated, and the æsthetical altogether ignored?

It is all very well for those old or young photographers whose conservative minds are in a state of blissful self-contentment to placidly cross their hands over their prosperous paunches and tell us all is well; that we are progressing in a very satisfactory way; that, despite the long list of absentees in each society, and the periodical sales of second-hand apparatus, &c., &c., retired photographers are "as rare as dead donkeys," and that "divine photography" stands in advance and high above all arts, past, present, and to come. A little wholesome grumbling and discontent are much better for us than such indolent ideas, and those who rouse us up to make fresh efforts in the right direction are far better, if less pleasant, councillors. The great philosophers who knew most were always the humblest and least contented, while the inaction of self-satisfaction, a sitting down at what is believed to be the goal, but which is really only the threshold, is merely the result of a blissful state of ignorance.

I hope my boldness will be excused, but I have not hesitated to denounce what I thought injurious to the art progress of photography in past years, and I hope I shall not be misunderstood in repeating the action now. Our societies and journals have been all in all to us we; owe them deep and earnest thanks; but, frankly speaking, has not the time come for reform in the extension of their aims and ends? In bringing this about nothing need be sacrificed that is really valuable or useful even in the humblest sense, only much may be gained that is imperatively called for for advance in the principles of artistic excellence, technical and æsthetic. Why should not the beauties and defects in the works of great modern artists, reviewed with a special regard to photographic requirements, be held up to us as beacons of warning, or suggestions of right paths? Why should not papers on artistic principles, reports of artists' debating clubs, and similar subjects, blend with reports of photographic societies, papers on chemical and optical subjects, or other cognate things? If photographers wish to be considered artists they must study upon art principles.

I must confess I see no reason why the study of art should be separated from the study of photography, as if the two things were quite distinct or discordant; and I prophesy a new lease of prosperity and life for the established journal which first takes up this idea in earnest go-aheaditiveness and works it out in practice. Not that I think this prophecy likely to be tested, or that such an event is at all likely to come to pass, at anyrate in our time; on the contrary, I am sorry to believe Mr. Mudd's dream will be found to be far more prophetic of the future than my hopes or aspirations are likely to be, unless, indeed, both photographic societies and photographic journals become things of the past, which I do not think quite probable.

These thoughts came upon me one evening when examining the works in the Photographic Exhibition, and while looking at Mrs. Cameron's idea of what constituted the artistic in photography—an idea which may be described as consisting in the main of a piece of light or dark drapery pulled about the figure or over the head of some person in modern costume, which is concealed with some difficulty by much tucking in here and pulling out there, and in the photographing thereof with a lens turned out of focus.

In the same Exhibition we have numerous other efforts of an intended artistical character, not more and very much less successful, which, however, it is not my present purpose to note. I shall also, for the same reason, pass over a few other of the productions there exhibited, although they display greater excellence of a technically artistic character than I have ever before seen in any productions but those of Mr. Rejlander, whose standard works, regarded both artistically and æsthetically, undoubtedly still retain their proud pre-eminence, although they are sometimes deficient in qualities of a more strictly technical description. And why is Mr. Rejlander thus exceptionally prominent? The reply sums up the pith and argument of all I have said. It is because Mr. Rejlander has received a thorough education as an artist; because he brought a cultivated imagination and poetical feelings into the photographic studio, and used the camera not only as a man of science but also as an artist.

Proceedings of Societies.

London Photographic Society.

The last meeting of the session was held on the evening of Tuesday, June 13th. Mr. J. Glaisher, F.R.S., in the chair.

The minutes of the previous meeting were read and confirmed.

The Chairman said, before proceeding to the business of the evening, he had to bring before the members the subject of an extensive correspondence he had received since the publication of the last *Journal*. He could not undertake to read it through, but he would explain its purport. The correspondence consisted of letters from three different gentlemen, all members of the Society, whom he should designate as A, B, and C, and its object seemed to be to affirm that the council had been doing its work very badly, the editor of the *Journal* not doing his duty at all, and that Mr. Simpson had been doing the duty of all of them. He then proceeded to read extracts from the letters, from which it appeared that a leader in the last number of the *Photographic Journal*, commenting on the paper read at the last meeting of the Society, had offended the author of that paper, and that he believed that the article was written by Mr. Simpson, editor of the Photographic News. Other extracts from A, B, and C followed, to the effect that it was well known that the society's *Journal* was under the control of Mr. Simpson, and suggesting that he wrote the articles, and, in short, did everything. Mr. Glaisher had informed the gentlemen in question of their error, but as they were persistent in their charges that the editor of the *Journal* neglected his duty and delegated it to another, he felt it imperative to enter into a searching inquiry. He received answer from Dr. Diamond that there was no truth in the matter; he received another from the manager of the *Journal* printing office that there was no truth in the matter; he received answer from other gentlemen who might be supposed to be cognisant of the fact if it existed, and in all cases failed to meet with a vestige of evidence in support of the charges. He had gone to Paternoster-row to the door of Mr. Simpson's office, with the intention of asking him; but he turned back, feeling that if the question were asked of him at all, it was due to him that it should be done publicly. He would now, therefore, for the purpose of more effectually clearing away the whole matter, ask Mr. Simpson, as a favour, to state if he had written the article in question, or any similar article, in the society's *Journal*.

Mr. Wharton Simpson said he would very briefly answer this singular question. It was a novel position he felt himself in; for, according to these letter-writers, it would seem "he was not one, but all mankind's epitome." He did not write the article in question. He had not written a line in the Society's *Journal* for many months (he believed not this year) to which his name was not appended. He had occasionally, in years gone by, at the request of his friend, Dr. Diamond, written practical articles for the *Journal*, and occasional items of intelligence. But he had never, that he remembered, written anything that criticised or commented on the papers or persons of anyone, or exercised any control whatever over the *Journal*. His own arduous duties, indeed, precluded such a possibility. He hoped that he had made it emphatically clear that there was not a particle of truth in the statement.

The Chairman said this was the answer he expected to receive, and he was much obliged to Mr. Simpson for making it. He would now simply add that he should henceforth very emphatically decline to receive any letters marked "private," which had reference to the conduct of the Society, or any persons connected with it. Before sitting down, he must refer to another charge against their secretary. It had been stated in another journal that a sum of money having been sent to him for the Goddard Fund, he had not acknowledged the full amount sent. The simple fact was that a sovereign was sent in the form of a coin; this the Post-office people detected, and, in accordance with their rule, charged eightpence, or a double registration fee; he accordingly, and very properly, acknowledged the receipt of 19*s*. 4*d*. in the *Journal;* but, whilst properly acknowledging it in this way, he really paid the eightpence out of his own pocket, and handed over twenty shillings to the treasurer of the fund. The Chairman then referred to some matters of business detail in reference to members who had not paid their subscriptions, and announced that in such cases their journals would be discontinued.

Mr. L. B. Buxton and Mr. Russell Manners Gordon were then duly elected members of the society.

Mr. Edwin Pettitt then read a paper on photo-binographs. These consisted in life-sized pictures obtained by the superposition on one sensitive surface of the two images of a stereoscopic negative, so as to produce one image. A stereoscopic portrait negative being taken with a binocular camera at 7 feet from the sitter, the negative was placed in the place of the ground glass, and turned towards the light, and the image received through the same lenses on a screen at 7 feet distance, where the images would accurately superpose and give, he stated, an image with stereoscopic relief. He exhibited two prints as illustrations, one an enlargement of life-size from a single negative, and the other of the same subject, the same size, produced with the two negatives. The latter certainly was much the best, having more detail, softness, and modelling.

After some general conversation,

Mr. Mayall said the idea was not new. Many years ago a similar idea was illustrated at the Polytechnic, some of his views of the Louvre being exhibited, which certainly gave, by the two images being thrown on the screen, the one on the other, great effect of relief. This did not, however, detract from the merit of applying the idea to portraiture.

Mr. Pettitt asked if Mr Mayall could refer him to any record of these experiments.

Mr. Mayall said it was done in the presence of several thousands of persons; but he could not say whether any printed record existed.

Mr. Pettitt said that, being landscapes, they could not be done at the proper distance to produce the proper superposition.

Mr. Sebastian Davies said that to do that the screen and the negative should occupy the same position in relation to the conjugate foci of the lenses, as the subject and the sensitive plate had occupied.

Mr. Mayall said, of course; and these being statuary, there was no difficulty about that. Whatever advantage, however, was found in applying the matter to portraiture was due to Mr. Pettitt. He did not, however, see much effect of relief in the specimen.

Mr. Pettitt said his aim had been to get truth rather than exaggerated relief. His lenses were only 2½ inches apart at 7 feet distance.

Mr. Mayall thought that as much relief might be obtained by a large lens; in fact, by stopping out the two halves in succession of a large single lens, and taking two pictures, these, when placed in a stereoscope, would give stereoscopic effect. So, if a large lens were used in the way described by Mr. Pettitt, it would render not only two, but all the different images defined by different portions of it.

Mr Peter Le Neve Foster said if the two images were really different, they could not blend accurately, and could only result in an imperfectly-defined picture; if they were identically the same, no possible good could arise from their use; but in neither case could stereoscopic relief be produced in a single picture.

Mr. Spottiswoode said if the two images could be thrown on a solid block of clay, as described by Mr. Claudet in his new method of photosculpture, the result would, he thought, be right; but not on a plane surface.

Mr. Pettitt said that if the specimen were examined through an opera glass, it would be seen in perfect relief, as if projecting from the frame.

Mr. Hughes hoped it would not be allowed to go forth that this Society had accepted, without repudiating it, a statement that stereoscopic relief could be produced by one picture on a plane surface. Whatever illusion of relief might be obtained by the production of a large image with much gradation, it was not due to the same causes as the relief obtained in stereoscopic vision, which arose from the blending in the brain of two dissimilar images seen by two eyes. The thing was impossible in its own nature. In stereoscopic vision each eye looked at a different object, and the brain blended them; but here both eyes were looking on the same image, and not two different images. Whatever merit the pictures might possess, or whatever advantage in the effect of softness and roundness might be obtained by blending slightly dissimilar lines and removing that offensive, wiry sharpness common to enlargements, let it be set down to its true cause, and not to stereoscopicity. Mr. Hughes then referred to the old notion of Mr. Alfred Smee, of moving the camera in the arc of a circle, of which the sitter should be the centre, during the time of exposure, which he thought would give relief; of course it only resulted in a blurred, soft image. He also referred to a favourite idea, at one time, of the Rev. J. B. Reade, for getting depth of definition by moving the lens with the rack and pinion during the time of exposure, so as to get, alternately, every plane from the tip of the nose to the ears in the best focus.

After some further conversational discussion, the subject dropped, and the Chairman, in moving a vote of thanks, remarked that they would be glad to see and hear Mr. Pettitt again at the meeting.

The Chairman then called attention to some very beautiful specimens of Mr. Simpson's collodio-choride of silver process produced on opal glass by Mr. Mayall. These consisted of a portrait of Mr. Bright, which Mr. Mayall said he had taken that morning, and had been able to produce and finish, with ease, several of the collodio-chloride prints in the same day. The Chairman thought this a satisfactory illustration of the value of one of the papers of the season.

The Chairman then read a letter from Mr. Ross, containing some interesting historic reminiscences in regard to lenses, and illustrated by two of the oldest photographic lenses and cameras, and some portraits, which were explained by Mr. Bensor.

Mr. Murray then exhibited and explained the new tent of Messrs. Murray and Heath, which we have already noticed.

The Chairman said the meeting was much indebted to Mr. Heisch for a sight of this tent. He hoped that in the coming session he might be induced to let them have a paper.

The Chairman read a letter from Mr. Wharton Simpson, calling attention to some of M. Poitevin's carbon prints of 1855, and also to some large photographs of the interior of the

Berlin Photographic Exhibition, now open, which he had received from Dr. Vogel.

The Chairman read a letter from a foreign gentleman, with some specimens of a secret process he wished to sell for £800.

The Secretary read a letter from the Secretary of the North London Photographic Association, calling attention to a forthcoming photographic exhibition in the north of London, and saying he would be happy to receive applications for space, and afford all information.

The Chairman said that as this was the last meeting of the session, during which they had had some good papers, he hoped members, after using their cameras during the summer, would have something to say and something to show at the commencement of next session. Mr. Hughes had come to his aid in the hour of need in the beginning of the session, and he should look for his aid again, as he would for that of Major Russell and others. He announced that Mr. Mayall had promised to open the next session with a paper "On Posing the Human Figure and the Construction of the Glass House."

The meeting was then adjourned until November next.

North London Photographic Association.

The last monthly meeting of the present session was held in Myddolton Hall, on the evening of Wednesday, June 7th, Mr. W. Warwick King in the chair.

The minutes of a previous meeting having been read and confirmed,

Mr. T. Burr, F.R.A.S., read an interesting paper "On the Application of Photography to the Continuous Self-Registration of Magnetic and Meteorological Phenomena as Practised at the Royal Observatory at Greenwich" (see p. 281). During the course of the paper, Mr. Burr exhibited some of the photographs indicating the perturbations of the magnet as registered by photography, and explained by the aid of diagrams the working of the apparatus employed.

The Chairman, in proposing a vote of thanks, remarked that Mr. Burr had described one of the most interesting applications of photography as an aid to science which had yet been made; and the record of the interesting details so lucidly communicated had evidently been a labour of love to Mr. Burr.

Mr. Taylor showed Mawson and Swan's printing-frame for pictures on opal glass by the collodio-chloride of silver process, or other processes requiring a pressure-frame, and also Mr. Bilcliffe's frame for a similar purpose, notices of both of which have already appeared in our columns. Mr. Taylor remarked that they both answered the purpose for which they were intended.

The Chairman then said, that as this was the last meeting of the session, it had occurred to him that it would be a very good plan if each member were to take some special subject to try and report upon at the commencement of the next session. He had brought with him some tannin negatives, a sight of which might interest members. He found the process, as he had been working it, more rapid and more certain than any other. It had been remarked that tannin plates should not be exposed in a bad light; but he did not see why they should not produce as good results as wet plates under similar circumstances, allowance being made as with the latter for long exposure with a large stop; some of the negatives he produced had been taken in a very dull light, without sun; using, the full aperture of a Dallmeyer's triple lens. One plate, taken with the same lens and a stop of about one-third of an inch, was fully exposed, in the dull light, with an exposure of 12 minutes.

Mr. Hill asked if Mr. King used any especial modification of the tannin process.

The Chairman said he used the process very nearly as described by Mr. Hughes, and in most cases the image was out after exposure. He used Hughes's collodion and bath. After exciting the plate he washed it in a dish of distilled water until greasiness disappeared, and then under the tap for about a minute. He then coated with a 15-grain solution of tannin, poured the first quantity away, then applied a second quantity, preserving that for the first application to the next plate. If the thick edges of the plate showed any brown stain it was unimportant; but if the stain went further than the edge he rejected the plate as having been imperfectly washed. The plates were then left to dry spontaneously. For development, he kept three solutions of citro-nitrate of silver; one with 10 grains of nitrate of silver and 10 grains of citric acid; another with 10 grains of nitrate of silver and 40 grains of citric acid; and a third with 10 grains of nitrate of silver and 60 grains of citric acid; in each case, of course, dissolved in an ounce of water. Before developing, he varnished the edges with a solution of wax in benzole. The film was then moistened with a mixture of alcohol and water, as suggested in the News by Mr. Bartholomew. He then washed the film with distilled water, and applied a 2-grain solution of pyrogallic acid with one drop of the citro-silver solution to each drachm. If the plate showed symptoms of being over-exposed, he used one of the strongly acid silver solution, and always intensified with the strong acid silver solution. The negatives thus obtained were intense enough without much surface piling up. He then fixed with a saturated solution of hypo.

Mr. Cole had found especial advantage in employing the alcohol and water for moistening the film, as suggested by Mr. Bartholomew. He had recently had a film off a large plate which cracked all over when moistened with water only, he poured this off and applied the alcohol and water, when the cracks disappeared.

In answer to a question, the Chairman said he did not approve of the use of albumen in the tannin process, the negatives produced by it which he had seen were hard.

The Chairman, in announcing the adjournment until the first Wednesday in October, expressed a hope that the table would be graced then with specimens of the summer's work, and that each member would be prepared with details of his experience.

A Member asked if anyone had had any experience in the use of carbonate of magnesia in the toning bath. He had been trying it with great success, the toning being rapid and excellent, and he had toned as many as five sheets of albumenized paper with one grain of chloride of gold.

South London Photographic Society.

The Annual Meeting was held on the evening of Thursday, June 8th, the Rev. F. F. Statham, M.A., F.G.S., &c., in the chair.

The minutes of a previous meeting having been read and confirmed, Messrs. E. C. Cornish and J. H. Benham were duly elected members of the society.

Mr. Wall presented a copy of the *Art-Student* to the society.

The Secretary read a letter received from the Secretary of the North London Photographic Association, calling attention to an exhibition of arts and manufactures to be held in the Agricultural Hall, Islington, in the course of the coming summer, of the photographic department of which the North London Association had taken the management. He invited contributions, and would be happy to supply forms and particulars.

Mr. Wall then read a paper entitled "A Few Thoughts on Photographic Art Progress" (see p. 282).

The Chairman said he cordially agreed with Mr. Wall in the love of art he expressed, but he could not endorse his censures on photography. Photography, it would be readily admitted, had not yet come up to the art standard which it might do, but still great progress has been made. He thought, indeed, they had had frequently on the table before them examples of photography which belied such stringent criticism. He remembered, especially, a view of the river and Houses of Parliament recently exhibited, which possessed especial artistic excellence. The presentation print that evening distributed amongst the members (Mr. Robinson's "Little Sunshine") was another illustration of the success in an artistic direction which photography achieved. Another remarkable example of artistic excellence he had but a few minutes before examined in the society's portfolio—he referred to Mr. Robinson's "Early Spring." Photography had already advanced much in this direction, and doubtless would progress further. But it must be borne in mind that progress was sometimes limited by other causes than the shortcomings of photographers. The practice of photography was with many a financial question, and they had to consider what would pay. It might be more interesting to the photographer to produce pleasing pictures, but in dealing with the portraits of Jones, Brown, and Robinson, in everyday costume, there was not so much opportunity of producing pictorial effects possible as in the representation of a Roman senator, or a lady with flowing draperies arranged after Raffaelle. Nevertheless, he commended the study of art and of the works of great artists to photographers, and great as their progress had already been, they would doubtless make still further artistic progress.

Mr. Howard thought Mr. Wall's strictures on the productions of photographers severe. Suppose, however, they looked for a moment on the other side of the question, and examined the photographic efforts of artists. He felt no hesitation in saying that the productions of those photographers who, whilst striving after excellence in photography, had studied art and endeavoured to apply it, were much better than that of those artists who had attempted to produce photographs. He did not for a moment deny that a successful photographer ought to understand and apply the elements of art, but it was imperative that he should be an efficient photographer technically, as well as an efficient artist.

Mr. Blanchard thought that, whilst considerable injustice had been done to photographers, they were indebted to Mr. Wall, at least, for speaking out so plainly. Photographers, especially very young ones, were apt to be conceited; but the more they examined good works of art, the more completely their conceit disappeared, and the more they felt the necessity of setting a higher standard before them. Nevertheless, he was not sure that it was by adherence to the old rules, known as the canons of art, that the highest success would be attained. Of these professional artists who had become professional photographers, scarcely one had produced, by the camera, artistic pictures.

Mr. Wall—Lake Price, Mr. Bedford, and others?

Mr. Blanchard, resuming, said LakerPrice scarcely ranked as a professional photographer, and as regarded Mr. Bedford, he had been especially referring to figure photography. There was a great danger of the photographer, who was rigidly educated as an artist, abiding by old notions, and thus feeling himself under some necessity of arranging his figures and draperies after Michael Angelo or Leonardo Da Vinci. The photographers with these notions of art were not men of progress. He believed, nevertheless, there were many photographers who were earnest and ardent students of art, who knew and felt how much was yet to be achieved by photography; and he, for one, did not object to a kick if it tended to stir up a consciousness of short-coming and a resolve to do better. Nevertheless, he regarded Mr. Wall's remarks as unjust, because sweeping and undiscriminating.

The Chairman thought Mr. Wall did not intend to be unjust; but his zeal for art had certainly made him sweeping in his condemnation of the discussion of processes, etc. No doubt a meeting of painters would find something better to discuss than the mixture of colours and the preparation of brushes and palettes; but these discussions nevertheless must have preceded the attainment of technical excellence.

Mr. Wharton Simpson said he apprehended that everybody would very readily agree with Mr. Wall that higher and more universal art-excellence in photograpy was desirable; but few would agree with him in saying that photographers entirely lacked the highest forms of artistic excellence in that degree of which they were capable of possessing such excellence, or that photographers were entirely indifferent to art culture. And notwithstanding the excess of attention to process of which Mr. Wall had complained, it was a notorious fact that by far the greater number of photographers were lamentably deficient in mastery over the lowest or most mechanical forms of technical skill. They might very easily comprehend within a dozen names those gentlemen who have a reputation for having completely reached the summit of technical excellence, and the works of these gentlemen generally also illustrated the highest artisticability; whilst it was also notorious that many persons had, after trying, failed to produce a presentable picture, who had, or thought they had, a considerable amount of artistic knowledge. Whilst this lack of technical skill and knowledge was so prevalent, he, for one, should not consider that too much attention was given to the rendering certain the mechanical or scientific sources of success. Besides, all the study which "process" received had for its aim the means of securing more certainly and easily the conditions of artistic excellence, and of giving their productions permanency when obtained. Notwithstanding the over attention to process complained of, it was still one of the reproaches of photography that they had no practicable printing process the productions of which they could pronounce to be absolutely permanent. He had heard it mentioned only a few days ago that a photographic enlargement which Mr. Sant, the academician, had been induced to colour at a cost of 200*l.*, within a few months was completely spoiled by becoming covered with yellow spots, the result of imperfection in the photograph. Thus the highest results of the painter's art were spoiled by imperfection of the photographer's process, or his ignorance or carelessness in applying it.

Mr. Sebastian Davis said the fact seemed scarcely to be recognised or remembered that advancement of art in photography was in many respects in direct ratio with its scientific progress. Take, for instance, the optical question. The lenses in existence in the earliest days of photography were in many respects incapable of producing good or artistic pictures, simply on account of the long exposure they rendered imperative. An improvement in construction was effected, and they were able to produce pictures in one-sixth of the time, which gave an immense advantage in securing artistic results. Again, but a comparatively short time ago, the lenses used for obtaining pictures of fine interiors rendered marginal straight lines by curves; and all the artistic knowledge in the world would not make a satisfactory picture of an interior if the lenses rendered it with curved columns. A skilful optician constructed the triple lens, and art photography was advanced to that extent, and the detestable curved lines were got rid of. Next it was found that the angle, say of 39°, which was possible to be obtained with the old landscape lens, was frequently insufficient to form a picture; it only gave a bit of a picture, and interfered with artistic results in this respect. Well, only within the last few weeks, photographers had had brought before them the result of the scientific research of the skilled optician in the shape of a lens which would define 60° or 80° without offensive loss of definition, and artistic photography was advanced in that direction. The progress of art photography and of scientific photography, it would thus be seen, really, to a great extent, went hand in hand. It was indeed an art science. A few years ago neither the chemical nor optical resources of the art would have permitted them to produce the charming instantaneous pictures, with cloud and other atmospheric effects, which were amongst the most artistic productions of the art. Again, the scientific studies of Major Russell had a similar bearing on the production of artistic results, and so in other matters; and, without the scientific progress of photography, no artistic progress, or none of importance, could ever have been secured.

Mr. Leake said that photographers were at present somewhat in a state of preliminary study, and it was necessary to learn first the capabilities of their art, and next to acquire the power of using them, before they attempted the highest artistic results. Besides, it was very unfair to judge of art progress by the examination of chance-selected pictures. Many a professional photographer was compelled to send out portraits of vulgar, plain, or obstinate people, of which he was utterly ashamed; and he related an anecdote of his trouble with a squinting lady, who insisted on a front-face portrait, as an illustration. It would be an excellent thing if art schools could be established for photographers.

Mr. Blanchard said he had for some months been awaiting an opportunity of making a suggestion to the Society as to the formation of a library of reference in connection with it. As a nucleus they might begin with some of the standard works of art not readily to be procured by many photographers. He meant such works as "Modern Painters," by Ruskin, a most valuable and suggestive work, but too costly for many persons, the price being some eight or nine guineas. He should be glad to see this Society have the credit of initiating such a course as this. He wished to add another remark on the general question. One reason why photographers failed to achieve so much in art as painters, arose from the fact that the painter had only to realize his own conceptions with his pencil. The photographer having a noble conception, had to impress that first into the mind of his model, if possible, and then photograph. Thus, in many things besides colour, the painter had an advantage over the photographer. One advantage which such men as Rejlander possessed as photographers was the almost magnetic influence of communicating his own feelings and expressions to his models when he desired.

The Chairman then suggested that after Mr. Wall had replied, he be requested to open the next session by some remarks on the subject.

Mr. Wall said that perhaps one reason why painters who took to photography tailed in acquiring the process perfectly was that men who could sketch a landscape in five minutes were impatient of the time necessary to acquire mechanical details of a scientific process. He did not agree with Mr. Blanchard that the formal rules of art which he condemned originated with the old masters. They belonged rather to the Sir Joshua Reynolds period and the brown-tree school of Beaumont. Artists of this day were shaking off these trammels. He thought on the whole that Messrs. Simpson, Leake, Blanchard, and others had only enforced what he had said, and both Mr. Leake and Mr. Blanchard had come out with practical suggestions of value, so that the discussion had effected some good. In pointing out the artistic short-comings of photography to photographers, he had done it to stir them to do better. Had he been addressing a meeting of painters on the same subject he would have maintained the art power of photography as much as ever he had done.

The Secretary the read the annual report, as follows:

Report of the Committee of the South London Photographic Society, June 8, 1865.

Your Committee, in laying before you the annual report, and in reviewing the past session, feel that there is much upon which they can congratulate the members in reference to the success which attends the Society. The meetings are well attended, an increased number are on the list of members, and no meeting has been held during the session without a paper on some interesting photographic subject being read to the members. In addition to which, many interesting and improved specimens of apparatus have been placed on the table at the several meetings.

Your Society is indebted to the following gentlemen for papers upon various photographic matters:—

Mr. Hart: On the Preparation of the Lime Toning Bath; also a paper on a Method of Recovering Silver from old Fixing Solutions.

Vice-President Mr. Wharton Simpson: On some Experiments in Printing with Salts of Uranium.

Mr. Cooper: On the Wothlytype Process.

Mr. Window: On Diamond Cameo Portraits.

Vice-President Sebastian Davis: Lines and Streaks in the Direction of the Dip of the Plate in the Nitrate Bath.

The Secretary: On some of the Defects in Landscape Photography.

Mr. Willis: On Printing with Vapour of Aniline.

Mr. Hughes: On Glass Houses, and Lighting the Sitter.

Mr. Grant: On Fuming Albumenized Paper.

Mr. Leake: On Lighting the Sitter, and Soft Pictures.

Mr. Harman: On Artificial Light for Enlarging.

Vice-President A. H. Wall: A Few Thoughts about Photographic Art Progress.

In addition to the above, your Society is beholden to the following gentlemen for exhibiting apparatus, &c., at the monthly meetings:—

Mr. Johnson, Pantascopic Company; Mr. Hart; Mr. Rowsell; Messrs. Marion; Messrs. Ottewill and Collis; Mr. Dallmeyer; Mr. How; Mr. Willis, and others.

Your Committe have to congratulate the members on the fine examples of photography which they have been able to obtain for the presentation prints for this year. It was their intention to have obtained a specimen of reproduction, but it was not considered desirable to wholly absorb the funds of the Society.

Your Society is much indebted to Mr. How for his great kindness in allowing the Committee to hold their meetings at his warehouse.

The Treasurer's report will be laid before you; it shows a balance, after satisfying all claims, against the Society.

Your Committee have to regret the withdrawal of Mr. Martin from the Committee. Mr. Martin has for some years past greatly assisted with his experience, and it is only from pressure of other duties that he now relinquishes his office.

In reviewing the past year, your Committee are of opinion that it has been very fruitful in practical results from experiments in new printing processes. They beg to refer to the Wothlytype, the Simpsontype, and the Aniline Printing by Mr. Willis.

The numerous exhibitions that have been and are being held this year show, your Committee trust, an increasing interest in all matters relating to photography by others than photographers.

The opportunities afforded by such exhibitions for comparative estimates will doubtless be of great assistance to both the professional and amateur.

In conclusion, your Committee trust that such a cordial support will be given by the members to promote the continued success of the Society, both by reading papers, producing specimens, and in attendance at meetings, that the pleasure of offering a congratulatory report will be of annual recurrence.

The Treasurer's report showed balance in hand of £7 14s. 10d.

The following gentlemen were then elected, or re-elected officers for the ensuing year:—

President—The Rev. F. F. Statham, M.A., F.G.S.

Vice-Presidents—T. Sebastian Davis, G. Wharton Simpson, A. H. Wall.

Committee—Messrs. Blanchard, Cooper, Foxlee, Harman, Harmer, Hart, How, H. P. Robinson.

Treasurer—Noel Edgar Fitch, 11, St. Johns Road, Brixton.

Honorary Secretary—Frank Howard, 10, Landsdowne Road North, South Lambeth.

The fourth presentation print of the year, Mr. H. P. Robinson's "Little Sunshine," was then distributed to members.

The out-door meetings for the summer were arranged to take place July 1st, Beckenham Station, London, Chatham, and Dover Line, to meet in the evening at 7, by the kind invitation of the President, at his house, 14, East Street, Walworth, for refreshment; on August the 5th, at Richmond Station; on September the 2nd, at Colney Hatch Station. Great Northern line, for Southgate. Each meeting as near 2 p.m. as possible.

After several votes of thanks, the proceedings terminated.

Talk in the Studio.

Collodio-Bromide of Silver Process.—Mr. Sayce has favoured us with a print from one of his recent collodio-bromide of silver negatives, which illustrates the very high state of perfection to which this process has now been brought; he informs us that the process works well and certainly either for wet or dry plates, and promises to furnish our readers with the most improved formulæ and manipulations. Judging from the example we have before us, this promises to be one of the most important and interesting steps yet made in the advancement of our art.

Lecture on Photography.—We have been favoured with a very able lecture on "Photography: its Position, History, and Prospects," by the Hon. J. William Strutt, which was delivered recently at Bury St. Edmund's. The pamphlet contains a most admirable, historic, and descriptive *résumé* of photography up to the present time, very discriminating in its comments and estimate of the position of the art.

Enlargement on Opal Glass.—Mr. Hall, of Brighton, recently showed us some exceedingly charming specimens of camera printing on opal glass, for which he had found considerable demand in his profession as a portraitist. The negatives employed were usually those taken for card portraits, or cameo heads, enlarged three or four diameters. On those he examined there was not the slightest apparent loss of definition, whilst there was an amount of boldness, roundness, and modelling we rarely see, and which Mr. Hall assured us generally appeared more decided in the enlargement than in the print from the original negative. The tone of these and general qualities were excellent. This is a direction of work well worthy the attention of portraitists, as it causes an increased demand for portraits, secured without the necessity of a resitting, and by enlarging appliances within the possession of every one.

A Photographer's Adventures in Persia.—In a volume recently published, entitled "A Journey from London to Persepolis," by J. Ussher, we find the following curious and startling adventures which are somewhat similar in result to the detention of Mr. Moens by the brigands of Southern Italy:—"A. M. de Blocqueville, a Parisian photographer, thought he could turn his talent to more avail in the far-distant East than in his native France, and started at once for the capital of the Shah, bringing with him all the necessary apparatus. He arrived safely at Teheran, where, being well received by the Shah, he felt assured he should soon acquire a fortune and fame by the exercise of that wonderful art of which the Persians were yet ignorant. He took likenesses of his majesty and sundry ladies of the court, and for some time things went on so prosperously that he began to consider his hopes in a fair way of fulfilment. But the moment was at hand that was to change the joy of the poor photographer into sorrow. The Turcomans of the north-eastern frontier having for some time been very unruly, it was considered necessary to send some troops to chastise their excesses. The Shah, desirous both of exhibiting his glory to his subjects, and of perpetuating the remembrance of the deeds of his armies for future generations, despatched along with the division sent against the insurgents the unlucky French artist, with orders to take photographs of the various acts of surrender, submission, &c., which were expected to be made by the Turcomans. For a time all went well. The army marched into the country they hoped to subdue without meeting with any opposition, and it seemed as if the whole campaign was to terminate in an inglorious submission on the part of the tribes. This was not, however, to be the case. A night attack was made by an immense force of cavalry on the Persian troops, whose tents, baggage, artillery, and ammunition, after their complete route, became the prey of the Turcomans. Two thousand stragglers succeeded in finding their way back to Meshed, but the far larger portion of the invincible force, among whom was the unhappy photographer, remained in the hands of the savage conquerors, who lost no time in fixing the price at which they were willing to ransom their captives. The artist, regarded by the criterion of his personal strength and utility as a camel herd, was priced at seven tomaums, or £3 10s., and this sum was demanded from the French charge d'affaires, Mons. de Bellonay, to whom he had referred. Unwilling to submit to such an indignity, the representative of the French Government remonstrated with the Persian authorities, who commissioned an agent to procure the release of the photographer. This coming to the ears of the plundering Turcomans, they imagined that they possessed a more valuable prize than they at first supposed, and at once raised their terms to £50, a sum below which they said their prisoner should not obtain his release. Meanwhile, rumours that a Frank had been taken among the Persian prisoners reached the ears of the Khan of Khiva, who, on hearing that a larger ransom than usual had been demanded by the Turcomans, at once jumped to the conclusion that the captive must be an officer of distinction. As the khan was anxious at this time to procure a drill-instructor for his troops, he sent to offer a still greater sum for the unfortunate artist, whom, from what he heard of the extraordinary instruments that had been taken with him, he supposed to be a man deeply learned in the art of war. It was no wonder, therefore, that the ignorant Turcomans, seeing the work that was made about the photographer, should imagine that they had in their grasp a prize, for which they should receive an extraordinary ransom. The sum demanded for the ambitious painter was accordingly raised from £3 10s. to £1,500, at which extravagant amount, the exchequer of the khan failing, or his avarice getting the better of his love of military glory, the unfortunate artist was at last ransomed by the French Government, after having for months endured every kind of hardship and privation.

To Correspondents.

Nemo.—You will find much of the information you desire regarding the choice of a dry process in the first article in our last number. Mr. Mudd, so far as we remember, using a single lens of 14 inches focus with half-inch stop, would consider 3 minutes a normal exposure with a good light; but he could, by forcing the development, get a good picture with 30 seconds' exposure. But all talk about exposures is very apt to be vague, because of the varying character of light and the kind of objects to be taken. The light within the last week or two has frequently been very non-actinic, and we have known exposures of 5 minutes fail to give good negatives with a light which apparently 45 seconds would have sufficed. Much also depends on the collodion used. Mr. Mudd has not published anything on the collodio-albumen process since the article he contributed to our fifth volume, and a few weeks ago he informed us that he used the process now exactly as he described it then. Mr. Mudd's studio is in Manchester. You have not quite understood the purport of Mr. Spiller's suggestion for the use of salt and water in washing prints.

Methistocles.—Most artists prefer having the surface of the albumenized print prepared in some way before applying water colours, and Newmans, of Soho Square, make a preparation for the purpose. Some use a little oxgall added to the colour to make it take kindly to the albumenized surface, and some add a little albumen to the water with which the colours are mixed.

Success.—You have made an improvement by adding more cotton, but we think a little more still would probably be an advantage, and also a little more nitrate of silver. We fear, however, that the cotton is scarcely of the right quality. Have you taken the precaution we recommend to be taken always at the outset? We always ascertain first that the cotton is free from opalescence or opacity in drying, by dropping a little of the plain collodion it yields on a glass, and, when the film is dry, ascertaining whether it is quite transparent and glassy, or opaque or opalescent. It is of little use unless it be quite transparent. We have printed from the excited paper sent and got good pictures, but the image is a little dead, the detail being buried and blacks wanting richness, something like the specimen you enclose; but the lights are quite pure. The collodio-chloride is very sensitive to weak light, and we suspect that yours has been a little exposed to light. A new bath of gold and carbonate of soda generally reduces all prints considerably. The paper is probably right, but that it is quite dry when coated. If you send us an addressed envelope we will enclose the print we obtained.

Mason.—All white enamels consist of metallic salts, and will probably be more or less injurious if taken into the system; it is better, therefore, to avoid contact with the tongue. We cannot tell you certainly the nature of the pigment used in enamelling the card you forward without analysis; but it is probably zinc white, which is now much used in place of white lead, at one time commonly used. The salt of zinc is less injurious than that of lead.

Sodium has an old negative bath which, working well, was put aside for some time in the dark, and, when tried again, appeared to excite the collodion plate; but after exposure and development, not the most feeble trace of an image was visible, even with prolonged exposure. We never met with such a case, and cannot form a conjecture as to the cause.

C. O. P.—A correspondent, Mr. Taglis, care of Mr. Newton, 94, Bolsover Street, W., will be glad to correspond with C. O. P. about the markings in his negatives, referred to in our last, and hopes the bath will be saved as it is for experiment.

J. T. A.—You may copy a card picture and produce a negative from it, but the copy will not be as good as the original, as the texture of the paper, &c., will interfere. The price of our Year-Book is one shilling. It can be obtained of the publisher.

One Who Studies the News shall have our attention shortly. We had not forgotten him, but have been much engaged.

One not Satisfied.—Hyposulphite of soda will answer perfectly well for fixing negatives, but you must use it sufficiently strong, and continue its application until all the yellow iodide of silver is removed, which you can easily see by examining the back of the plate. Pin-holes may arise from dust, or from your bath being turbid, or from excess of iodide of silver, or from other causes. The print enclosed is from a negative not quite sufficiently exposed, and not quite intense enough. You must print much deeper in order to get rich tones. Endeavour to obtain a more brilliant negative, and you may then succeed in getting richer prints.

Sam Corrigan.—Received, and shall have attention.

Fiat Lux.—When prints are immersed in the gold bath without previous washing, they generally tone more rapidly and more richly, but it is at a sacrifice of both silver and gold. The gold bath is more rapidly decomposed, and the silver is either lost or is more difficult to recover. The prints ought also to be well washed before fixing, as some trace of nitrate of silver may still remain, which will tend to decompose the hypo. There will be a precipitate of chloride of silver in the toning bath, and some nitrate of silver may remain in solution in it, which will be thrown down in a metallic form with the gold by means of the protosulphate of iron used to precipitate the gold. If the gold thrown down be made into chloride, the silver may then be separated by filtration as an insoluble chloride.

The Art-Student and Photography.—The Editor of the *Art-Student* feels that he is not fairly rendered in our "Echoes of the Month," by the sentence which represents him as having said that "Photographers had grown wiser, and eaten humble pie" The sentence here put affirmatively stands in the original paragraph interrogatively, but with, as it appears to us, an affirmative suggestion. We will, however, reproduce the whole paragraph, and leave our readers to judge of its meaning. The *Art-Student* for May says: "Photographers are strange animals. They were awfully indignant with the classification of their art in the Exhibition of 1862, and filled the papers with their complaints; and now one of their London Societies, superintending an exhibition of photographs in connection with the North London Exhibition of Arts and Manufactures, has adopted precisely the same classification, we believe in the very same words. Have they grown wiser, and eaten humble pie?" The implied suggestion is, here, that eating humble pie would be a natural consequence of growing wiser. We readily admit, however, that it is probably only an unfortunately-expressed phrase. A gentleman like Mr. Wall, whose pen has been often ably and eloquently used on behalf of photography, could not mean to cast the slight upon it which his words suggest, any more than he could really mean the sweeping censures expressed in his paper before the last South London meeting given on another page.

Magnesium and other Artificial Lights.—The communication on this subject in our last should have been signed W. H. Olley, instead of W. H. Otley, as printed. A letter on the same subject, in answer to Mr. Olley, will appear in our next, an unusual pressure on our space compelling it and several other communications to stand over.

Several Correspondents in our next.

J. A. Barcelona.—Subscription received to No. 374.

Photographs Registered during the Past Week.

Mr. A. Glass, Burslem,
Two Groups of P. and P. Officers of Manchester Odd Fellows.
Mr. A. Szarkowski, Stourbridge,
Six Views of Articles in Cut Glass.
Mr. J. Nunn, Ship Street, Brighton,
Introduction to Portrait Album.
Mr. Henry Berlon, North Parade, Bradford,
Portrait of "Louis Blanc."
Mr. Francis H. Dufty, Clifton, Bristol,
Photograph of Drawing, "Laying the Foundation Stone of Clifton Suspension Bridge."
Mr. Henry Lambiat, Fountain Buildings, Bath,
Portrait of Dr. Winslow.
Portrait of Rev. J. Beresford.
Mr. W. H. Midwinter, College Green, Bristol,
Portrait of W. D. Wills, Esq.
Portrait of Rev. J. Glendenning.
Mr. J. Samblin, Oundle,
Ten Views of Oundle Church.
Mr. W. J. Willsted, Paragon Street, Hull,
Two Photographs of 100 Members and Delegates of Primitive Methodist Conference, Hull.
Mr. F. Donnel, Watford,
Two Portraits of Hon. Francis Villiers.
Two Portraits of Lady Emily Villiers and Hon. F. Villiers.
Mr. Watson, Great Yarmouth,
Portrait of Rev. Rivett.
Mr. Andrew Melliss, 120, Bold Street, Liverpool,
Five Portraits of Miss Kate Saville. (Second acknowledgment, corrected.)

THE PHOTOGRAPHIC NEWS.

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DR. VAN MONCKHOVEN'S NEW RAPID METHOD OF ENLARGING.

At the last meeting of the French Photographic Society, Dr. Van Monckhoven read a communication on a new rapid method of enlarging, which promises to be of the very highest importance, not simply as a method of enlarging, but as a method of printing by development, giving better results and a more certain method of obtaining them than have hitherto been possessed. The common tendency of developed enlargements, as photographers well know, has been to a greyish black or a greenish black in colour, and sunken and dull in texture. We have seen charming exceptions; but they are not common. Developed prints on albumenized paper have been attempted, and more brilliancy and richness in the blacks occasionally obtained; but the whites have generally been yellow and the prints frequently stained From some cause—what we cannot say—the process which gave such magnificent results in the hands of M. Blanquart Evrard does not seem to have been adopted generally, either in enlargement or printing direct from the negative. At least we have not seen any such results. The excellent system of development-printing of Mr. Sutton, with which we have seen him produce exceedingly beautiful prints, does not, judging from the enlargements we have often seen, appear to have been adopted or mastered. The best prints we have seen have been by formulæ we have published, and, judging from examples occasionally sent to us, some of them do not seem to succeed universally except in skilled hands.

The ingenious and beautiful process described on another page by Dr. Van Monckhoven promises to remove one important difficulty, in supplying an organic salt of silver which does not turn yellow under the action of gallic acid, like albumen, and which seems to confer a remarkable degree of sensitiveness as well as vigour. The prints, examples of which we have seen, both plain and with a glazed surface, are remarkably rich in colour, varying from a fine deep chesnut-brown to warm, intense black of very velvet-like texture, possessing at the same time pure whites and fine gradations. In a private letter Dr. Van Monckhoven informs us that every variety of tone can be readily obtained at will, and with unfailing rapidity. We commend his able paper to the attention of our readers, and shall be glad to hear of the success of some of them in applying it.

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THE EXHIBITION OF PORTRAIT MINIATURES AT SOUTH KENSINGTON.

We commend those of our readers, who have opportunity, to visit the exhibition, now open at South Kensington Museum, of the most extraordinary collection of miniatures ever brought together. Adjoining the Raffaelle room, admirably arranged in glass cases, easy to examine, and with numbers and references attached to each case, are displayed upwards of three thousand miniatures on paper, vellum, ivory, and copper; in water, oil, pencil, and enamel, by the greatest of ancient and modern masters. The art value and historic associations of many of the examples will well repay the visitor; but we especially commend a visit to photographers, both for instruction and encouragement.

The photographic portraitist cannot fail to be instructed and gain ideas from the examination of so large a collection of miniatures, including the productions of so many great men. Hints in pose, arrangement, grouping, and general treatment will be readily gathered by the observant student, and from none will these hints be more valuable to the photographer than those suggested by the admirable pictures of Thorburn and Wells, which, in our estimation, are amongst the best, if not the best exhibited. Amongst the older painters, besides some Holbeins, a few specimens of the work of Samuel Cooper, the painter of Oliver Cromwell—of whom, by the way, there are, we are afraid to say how many, professed originals—are especially worthy of attention as examples of solid, fine portraiture. There are many others, of course, whose general treatment in lighting and posing will be suggestive and valuable, and, as we have said, instructive to the photographer.

But we have remarked that the photographer might also derive *encouragement* from a contemplation of this exhibition. We have no desire to increase the overweening conceit which Mr. Blanchard recently suggested was a common failing of young photographers; but in behalf of our art, so systematically depreciated, we must confess we felt considerable satisfaction as we passed through this collection a few days ago. "Well," exclaimed a lady to her companion, in our hearing, after attentively examining one case of miniatures, "if these are good, photographs can *not* be true!" We felt quite ready to indorse the lady's criticism, but we also felt how truly, in this instance, "your *if* is a great peacemaker." Primarily, we were struck with the fact that amongst the works, not simply of one artist, but of one period, there was a common family likeness in all the portraits. Queen Elizabeth objected to being painted with any shadow; and not her face alone, but scores of others of that time, appear flat, insipid, and feeble. When the style of Sir Peter Lely and Sir Godfrey Kneller were in the ascendant, all the ladies seem to have had round, surprised-looking eyes, rosy cheeks, ripe cherry lips, and full bosoms; and in all times, especially amongst the second-rate artists, there is a prevalence of impossibly large eyes, ridiculously small mouths, and noses made from two or three standard patterns, Grecian or Roman, with an occasional sprinkling of *le nez retroussé*. We avow our conviction that there is not only more truth, but more real pictorial value in a good portrait photograph, such as we have seen by Williams, by Robinson, by Mayall, by Claudet, by Hughes, by Rodgers, by Blanchard, and half a score of others, than there is in half or three-fourths of the miniatures now exhibited in South Kensington Museum. Photography has been charged with being conventional and common-place. It is too often sadly too much so. But it has only reproduced the conventionalities of the miniature portraitist, who was much less bound by the lack of plasticity in his materials than the photographer. Here we find amongst these art-productions the original types of the conventional pictorial background in regard to which smart writers have so frequently girded and jibed at photography and photographers; we have here the column and curtain, the balcony and terrace, the pedestal and staircase, and other artistic stage effects and properties. Nor are these always used with more judgment by the painter than by the photographer; but are often just as unmeaning and offensive. We believe that photographers, by using these things to excess, have really helped to explode their use–at all, at least in the indiscriminate and unmeaningly incongruous manner at one time common. We believe, moreover, that photography has elevated the public taste in portraiture, and that even if photography were to become one of the lost arts, the namby-pamby style of miniature with eyes too large for the sockets, and mouth perpetually adjusted to the utterance of "prism and prunes," with big forehead and weak chin, and carmine cheeks and cobalt shadows, would never again be tolerated, and that the works only of those who paint some honest, actual resemblance to the human face divine would be accepted as portraits. Of these there are luckily some examples in this exhibition. Thorburn unhappily has ceased to paint charming miniatures, and begun to paint large oil pictures which will not enhance his reputation; but there are still some first-class miniature painters, despite the prevalence of photography. A portrait of the Princess Alice by Moira is one of the finest exhibited in this loan collection.

We need scarcely commend to the attention of the educated visitor the magnificent enamels of H. P. Bone, and of Essex; nor of those of Hurter and Petitot, and others, both rare and beautiful. As exquisite examples of pencil work on vellum, some miniatures by Forster, after paintings by Kneller and others, will interest the curious; a circular picture, a portrait of a child by R. J. Lane, is the most perfect and delicate thing in pencil we have seen, and should not be overlooked by the visitor.

Critical Notices.

A TREATISE ON PHOTOGRAPHY. By Charles Waldack. Fourth Edition. Cincinnati: H. Watkin.

This is a new and completely revised and rewritten edition of Mr. Waldack's manual of photography, bringing it up to the present time. It is one of the most clear, succinct, and practical books we know, and we can confidently and cordially recommend it to all who require a complete compendium of the present practice of the art. Every process which has acquired a recognized position is given with sufficient detail to afford working instructions. We give as an example the following chapter on

OUT-DOOR PHOTOGRAPHY.

The outfit for out-door photography should be selected with reference to small weight, compactness, and portability. It should consist of the following articles:—

A dark tent or developing-box; a water-bag; a light folding camera with plate-holder, lens, etc.; a light and solid tripod stand; a water-level; a bath-dish of gutta-percha or vulcanite; a grooved box, with glass; a soft camel-hair brush; a bottle of collodion; a strong bottle, well wrapped up, holding the silver solution; a bottle with developing solution; a bottle with the pyrogallic acid or tartaric acid and iron redeveloping solution; a small bottle of 20-grain silver solution for redeveloping; a bottle with fixing solution; a bottle with glycerine.

These articles should be packed in two light boxes, with strap, so as to be easily carried—one of these boxes to hold the camera, plate-holder, water-bag, etc., the other to contain the chemicals. When a developing-box is used, the chemicals may be packed into it. The tripod-stand can be strapped on one of the boxes.

The developing-box which Mr. Waldack prefers when working small plates is then described.

When large plates have to be used, it is best to have a tent, or a van, covered with oil-cloth. Many models for tents have been proposed, all more or less objectionable, either on account of weight or solidity. The handiest one we have used was a piece of double thick muslin thrown over a tripod-stand about eight feet high, and extended by having five or six ropes attached by one end to the upper part of the cloth, and by the other to some tree or other object near by, or to a spike driven in the ground. The objection to tents is the annoyance caused by the dust. They should thus be pitched in a grassy place, and, if necessary, the ground around should be sprinkled with water.

A good water-bag can be made of india-rubber, by taking a piece of tubing about six inches in diameter, and cementing both ends by means of india-rubber dissolved in benzine, inserting at one end a mouth of hard rubber, through which the water is poured in, and on the other a tube about eight or ten feet long, which passes into the tent or developing-box through a little hole. The bag is hung on a tree, or other object, and the end of the tube is closed by means of one of the wooden clips used for hanging up prepared paper.

The camera should be as light as possible, and fold up so as to present but a small volume. The lens should be fixed on a board which slides up or down, so as to allow of more sky or more foreground, according to circumstances. The tripod-stand should combine the advantages of small weight with that of solidity. A light and very solid stand can be made of the kind of cane used for fishing rods.

The bath-dish ought to be made of a material which is not liable to break. Vulcanite or gutta-percha answers best. If the cover be made to fit tightly it will save the carrying of a bottle to hold the silver solution.

Some landscape photographers cover the plate, after it has been developed and drained, with a diluted solution of glycerine, and perform the fixing and redeveloping, as strengthening, at home. When this plan is adopted, the outfit is considerably reduced, no water, fixing solution, nor redeveloping solution being required.

The lenses used for making views are, the meniscus, or single achromatic lens, the globe lens, the triplet. the orthoscopic, and sometimes the double combination or portrait lens. The single achromatic lens is the best for general purposes. When sufficiently diaphragmed, it gives a definition superior to that given by any other lens. For architectural subjects it will not answer so well, unless used at a sufficient distance, on account of the distortion of the marginal lines. The globe lens is free from this defect, and is thus well suited to architectural subjects, especially when there is little space in front.

The globe lens possesses, also, much depth of focus; that is, it brings objects situated at different planes in focus at the same time. It is not equal in definition, however, to the single lens, and always requires to be strongly diaphragmed to correct the spherical aberration. It has the advantage of giving an image including an angle of view two or three times as wide as that given by the meniscus.

The triplet manufactured by Dallmeyer, London, also gives images free from distortion, and includes the same angle of view as the globe lens. It has somewhat less depth of focus, but, when used with a large diaphragm, is superior to it in definition.

The same may be said of the triplet manufactured by Ross as of that made by Dallmeyer, with the exception that it gives an image including a smaller angle.

Petzval orthoscopic lens, as we have seen already, gives an image in which the marginal lines, instead of bending inward, bend outward. Architectural subjects may be reproduced by it quite correctly, by tilting the camera slightly upward. The qualities of the orthoscopic lens are great definition and flatness of field.

The double combination or portrait lens is used in out-door photography, when every other quality has to be sacrificed to rapidity of action, as, for instance, when moving objects have to be photographed. The great defect of the portrait lens is the curved field it gives.

The camera should be perfectly level. If it was pointed downward or upward. the vertical lines in the view would fall inward or outward. If, by having the camera horizontal, there is too much foreground or too much sky in the image, raise or lower the slide to which the lens is attached.

The most favourable moment to take a view is when the rays of the sun fall obliquely on the object. When the sun is right behind the camera, the picture produced is too flat. The peculiar manner of illumination depends, however, greatly on the object itself, and on the taste of the operator.

The camera should be placed so that the rays of the sun do not fall on the lens, in order to avoid reflections, which would cause fogginess in the picture. When the picture includes a large amount of strongly-illuminated sky, and a double or triple lens is used, a light circular spot is seen in the centre of the ground glass, which is the more visible as the stop used is smaller. This appearance is known to photographers by the name of *ghost*. Single lenses are not liable to it, it being produced by the reflection of the light from one lens to the other. The only way to obviate this defect, to some extent, is to cut off the sky part during the larger part of the exposure, and allow it to impress the sensitive plate for a very short time toward the end. This is easily done by using, as a cover to the lens, a small square board hinged on the upper part, so that it can be raised and lowered. By looking on the ground glass it can be set in such a position that it cuts off the sky. Giving, then, three-fourths of the proper exposure, it is raised more, so as to allow the sky to be impressed, the rest of the exposure is given, and the lens is covered up. As the appearance of the ghost is generally accompanied by a solarized sky, the short exposure given to that part of the image prevents the solarization. When the means described is not practicable, on account of the outline of the sky being irregular, an imperfect remedy is found in adapting in front of the lens a funnel, made of blackened pasteboard, so that all rays not active in producing the impression be excluded.

The size of a stop to be used is a matter of consideration for the photographer. The smaller the stop the longer exposure is required. If the length of the exposure is no object, a small stop should be used, for a superior definition will be the result, and objects in different planes will be made equally sharp. For a landscape, in which there is no principal object, to which everything else should be sacrificed, if need be, the focus should be taken on a part of the scenery which is half-way between the principal objects in the foreground and those in the background. By inserting a stop every plane is then pictured with sufficient definition. When a picture is wished of a single object, such as a building, or a monument, the focus is taken on a point half-way between the center and the edge of the object. In taking the focus, make use of a magnifying glass. Darlot's eye-piece is very well suited to the purpose; it magnifies the image sufficiently to see plainly the smallest details. It is composed of a combination of lenses set in a tube. This tube itself slides into another tube, and can be fastened at any point by means of a screw. The eye-piece, before being used, is to be set to the eyesight of the operator. This is done in the following way: Take a piece of ground glass, make a pencil mark on the ground side, and set it against the window, the ground side outward. Then put the mouth of the eye-piece against it, and draw the inside tube forward or backward, just as in focussing, until you see a sharp image of the pencil mark, after which you tighten the screw. All the operator has to do now, when he wishes to look at the focus, is to apply it against the ground glass of the camera.

In photographing foliage, a bromo-iodized collodion is necessary. Sufficient detail is brought out by a long exposure. The image is generally weak, and needs a good deal of redeveloping or strengthening to acquire sufficient intensity. In such subjects, the sky is generally thin from being solarized, unless the contrivance spoken of above, to give a shorter exposure to the sky than to the landscape, be made use of.

VIEWS IN SCOTLAND. By G. Restall, Birmingham.

Mr. Restall has produced and published one of the noblest collections of views of Scottish scenery which have come under our notice. The series is very large and comprehensive, consisting of between three hundred and four hundred photographs on 15 by 12 plates, a size which does full justice to the large, rugged, and majestic character of the landscape. The subjects and the points of view are selected with an artist's eye and photographed by a skilled manipulator, whose trained hand has well seconded the artist's judgment in giving force or delicacy in the degree demanded by each subject. The majority of the pictures are free from the blackness and hardness which have too often characterised large photographs of Highland scenery; these are atmospheric and full of detail, and admirably lighted, so as to give breadth and relief. Fine skies, with massive natural clouds, add a charm to the pictures which has too often been wanting in similar subjects. The task of producing single-handed several hundred of such large negatives, working in a tent, with the apparatus and chemicals carried over all manner of rugged roads on a pony, has been overcome with marvellous skill and success. We understand that Her Majesty has signified her approval of the pictures by ordering a complete set. We hope they will circulate widely, and do the art and artist credit.

STEREOGRAPHS OF SCENERY IN MID-WALES.

By W. H. Warner, Ross.

Mr. Warner has produced a charming series of stereographs of subjects as difficult to render well as they are charming and worth rendering. Delicate, sharp, and brilliant, many of these are amongst the best pictures we have seen of Welsh scenery.

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THE INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT BERLIN.

English contributors to the Berlin Exhibition, and photographers generally, will read with pleasure the interesting particulars which we have received in a letter from Dr. Vogel, to whose assiduous efforts much of the success of the exhibition is due. He accompanies the letter with two very large photographs showing the arrangements. The hanging appears to be admirably done, and we can readily trace many of the English contributions which grace the walls. We should have been glad to have engraved the photographs, to give additional interest to this report, but for the unsuitableness of our columns for the very large scale which would be necessary to preserve anything like useful detail in the engraving. We had the opportunity, however, of showing the prints at the only remaining photographic meeting of the session on Tuesday night week, where they were examined with interest.

"Dear Sir,—I have long been indebted to you for a special report of our Exhibition. The multiplicity of duties however, developed upon me as President, have prevented me until now entering into details. I hope that this report will not arrive too late to be interesting.

"Herewith you will receive two pictures of the place of our Exhibition, which may serve to give you an idea of the greatness of our undertaking. It is a fine wall one hundred feet long, fifty feet wide, and fifty feet high, with two galleries and three middle partitions, filled to the roof with photographic chemicals and apparatus. The entire impression is magnificent.

"It will certainly afford your countrymen much pleasure to become acquainted with the place where their beautiful contributions are exhibited. Let us proceed to a description of the Exhibition. This is arranged in five divisions.

"*First Division.*—Process of the development of photography arranged by myself. Here you find a series of pictures from the *first beginning* of photography; pictures by the methods of Daguerre and Talbot; albumen negatives down to the latest improvements, such as dry plates, Pouncy's and Swan's carbon plates, Simpsontypes, Willis's Aniline method of printing &c. Here your fatherland takes a position with its interesting productions in the foreground. The carbon pictures of Swan are the most beautiful of any which I have ever seen, and it may be interesting to you to learn that Mr. Borchardt of Rigohorg prepares for the public carbon prints according to Swan's experiments. He has hung up two tableaux, the one of silver prints, the other of carbon prints. The latter surpass the former in beauty.

"Willis's aniline prints attract great attention. The discovery is highly ingenious, and I am greatly pleased with it. Your chloride of silver collodion is already an article of trade here. The photographs and colours of Riccofelice in Modena, Italy, are very remarkable. These are washed and dryed like common silver prints, and, after being taken from the printing frame, a solution of gold of different strengths is spread with the pencil upon different parts, producing very different tones of colour, blue, red, and brown. Next the picture is, as usual, fixed. The red flesh colours succeed the best, which, however, are easily spotted.

"After illustrations of the process of development come a series of applications of photography in science, art and industry.

"And here, also, England has given a fine contribution.

All the world admires the large photograph of the moon by Warren De la Rue, which has been presented by him to the Academy of Sciences here; and whose pictures of the eclipse of the sun and the moon have been given by him to the Royal Polytechnic Institution. The micro-photographs are very interesting. Here is a mammoth flea by Duvette, of Amiens, and a mammoth louse by Kellner, which create the greatest sensation. For the instruction of the public I have supplied this part of the exhibition with some scientific curiosites, *e.g.*, a table of colours with a photograph corresponding to it, to show the action of different colours, then a photograph of the spectrum, and one of Stukes' china writing. Next follow pictures of criminals with explanations—a rogue's gallery.

"*The Second Division* contains photolithography and photographic engravings, to which England has also contributed much of interest. Here, with great esteem, I name first Fox Talbot, who has delighted us with a fine series of engravings. The we have Osborne's and Pouncy's photolithographs. The most beautiful photolithographs in *half tones* are from M. Susse Maire, in Paris. I have never seen anything so remarkable. One might mistake them for photographs

"Amongst local exhibitors Korn and Burchault, of Berlin, excel. Highly interesting is a series of photographs of old manuscripts—Livius, Luther, &c. In engravings, the Government Printing establishment at Vienna carries the palm. They work according to the Pretzjen process, and have sent a series of pictures which charm all observers. Of the greatness of this contribution in photolithography and heliographs you may obtain an idea when I inform you that it occupies a space of one hundred feet in length and twelve feet in height.

Among the most noticeable objects in the exhibition are the photographs burnt in porcelain, china, glass, &c. They occupy a space nearly five feet long by three feet in width. Only one foreigner is represented here—Deroche and Heylandt in Mailand, who have produced a series of very pretty gems. Mr. Grüne, the eminent chemist in Berlin, takes the first rank in this department; in his contribution are to be found photographs on vases, plates, lamps, &c., and, indeed, gravestones with the photograph of the deceased burned in. His articles are distinguished for beauty and cheapness.*

Obernetter of Munich has also produced a series of fine porcelain photographs, and in addition, the Royal Porcelain Manufactory of Berlin, also three other finer of minor importance. You see that this branch of industry which formerly was introduced by Lafon de Camarsac has now a attained high state of perfection in Germany, and I wonder that I hear so little of this in England.

Let us now proceed to the portrait and figure department. This department is by far the most rich and comprehensive. I will begin with Robinson's compositions, which have almost thrown into raptures those who have beheld them. I have already expressed to you my admiration of it, and am only sorry that the German language is not more cultivated in England, else I would send you many newspaper articles which are full of his praise. The photographers here have already began to imitate his example, and a very fine picture is exhibited by Herr Nickel. Mr. Robinson's pictures are artistically, the most important of any here. After Robinson's the Studies of Life by Rejlander begin, and those from Miss Cameron, Isle of Wight. Rejlander is already so well-known in England that I do not need to say anything in his praise. His contributions are to be ranked among some of the finest in the Exhibition, I envy him his beautiful model and his fine group of children. Of Miss Cameron I have never heard or read anything, but I must grant to her pictures, in some respects, my great approbation. They are, it is true, technically imperfect, but a very fine taste and feeling is manifest. Professor Richter, one of our best artists, has found much pleasure in them. They are a series of Madonnas from life, similar to Rejlander's, and several very expensive portraits of Tennyson, Taylor, &c., &c. You see that in figures also your Fatherland obtains great honour, and I admire—and I remark it here—the wonderful landscapes of Bedford and Vernon Heath. The latter has presented our society with a series of thirty landscapes, and we rejoice that we are able to adorn our society room with them; it is a precious present. But we will return to the portraits, and here the other nations will claim our notice, details of which I hope to send you shortly.

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TO DUBLIN AND BACK, WITH A GLANCE AT THE EXHIBITION.

BY J. WERGE.*

After breakfast, and having made ourselves internally and externally comfortable, we start for the Exhibition, which is within easy walking distance of the hotel; but the car fares are so very moderate that we prefer a "rowl." The fare is sixpence a "set down;" that is, you may ride from one end ot the city to the other for sixpence, but if you get off to post a letter, or buy an umbrella to keep the rain off—for the cars have no covering—that is a "set down;" and so every time you get down and get up again you have sixpence to pay, no matter how short the distance you are taken each time. So we hailed a car at the door of the hotel, determined to be "rowled" to the Exhibition for sixpence each. We go down Dame-street, across College-green, up Grafton-street, along the west and south sides of St. Stephen's-green or square to Earlsfort-terrace and the principal entrance to the Dublin Exhibition, which occupies the site of what was formerly Coburg Gardens.

Arriving at the entrance-hall, we pay our admission fee, and on passing the registering turnstiles we are at once in the sculpture-hall on the ground-floor, the contents of which we shall notice more particularly by-and-by. Passing through the sculpture-hall we are within the western transept, or winter garden portion of the Exhibition. This transept is 500 feet long, and of lofty proportions, with galleries on each side, and tastefully hung with the banners and flags of the nations exhibiting. The northern court is about 300 feet long, also of iron and glass, with galleries running round both sides similar to the western transept. The ground-floor and part of the galleries of the northern court are devoted to the productions of the United Kingdom. On the north side of the northern court is the machinery department, both at rest and in motion. Here machines of the most delicate and ponderous nature are at work. There a forge-hammer daintily cracking nuts, or coming down with a crushing force at the will of the attendant. In another place a delicate curving-machine is at work; and another can be seen making steel pens. There are high pressure engines, sewing machines, and photographic rolling-presses. Indeed, there is almost everything to be seen and everything going on that is instructive, edifying, and amusing. The Exhibition building is small, but well arranged and compact, and partakes of the character of an art and industrial exhibition and place of amusement and recreation, like our Crystal Palace at Sydenham, with ornamental gardens and archery grounds attached. The gardens are small—a little larger than the area of the building itself—but most tastefully laid out. And there are fountains and grottoes, and rockeries and cascades, with flowers growing about them, which give the whole place a pleasant, healthy, and delightful appearance. Stepping out of the western transept into the gardens, we found the band of the 78th Highlanders playing in the centre, and their pipers walking about the grounds ready to take up the strains of music in another key, for presently we saw them marching about, playing "Hielan' Skirls," and sounding the loud pibroch, with a five-bag power, that was more stunning than the nocturnal wailings of a dozen or two of Kilkenny cats. The directors furnish music and offer other inducements to secure a good attendance, and their efforts ought to be successful, and it is to be hoped they will be so.

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* I would here remark that Mr. Grüne will sell his process for a moderate price.

* Continued from p. 281.

On the first day of our visit there was a grand archery meeting, and the turn-out of Dublin belles was double in numbers. There was a large attendance of bowmen, too, and belles and beaux were banging away at the targets most unmercifully in keen contest for the prize; whether it was a medal, a ring, or an heiress, we could not learn; but if nothing more than the privilege of entering the lists against such lovely competitors, the bowmen ought to have been satisfied; but we don't suppose they were, for men are both ambitious and avaricious, and probably some of them hoped to win a prize medal, kill a beauty, and catch an heiress all at once, with one swift arrow sent whizzing and quivering into the very heart and gilded centre of the gaily-painted target.

Perched up on the top of the cascades we noticed a double sliding-front stereoscopic camera, and doubtless Mr. York was busy photographing the scene we have been describing—impressions of which the London Stereoscopic Company will probably issue ere long. We must, however, leave this gay scene and turn our attention to other things, certainly not more attractive; but duty calls us away from beauty, and we must submit.

Re-entering the Exhibition building, we seek the photographic department, which we readily find on the ground-floor, between the music hall and the first class refreshment-room. Entering from the Belgian department in the western transept, we find three rooms in the main building devoted to the exhibition of photographs, and a lobby between the rooms pretty well filled with apparatus. To Sir J. Jocelyn Coghill are photographers indebted for obtaining so much space for their works, and in such a get-at-able situation; but it is a pity the rooms are not better lighted. Many of the pictures on the screens are very indistinctly seen, and some are in dark corners, scarcely to be seen at all.

The foreign department, which is the first room we enter, is mainly made up of reproductions of old and modern engravings, and copies of drawings and paintings. One very remarkable photograph on the wall of this room is an immense magnification of a flea, by A. Duvette. What a subject for the camera! One that suggests in sporting phraseology something more than the "find," the "chase," and the "death."

A panoramic view of Rome, by M. Petagna, is a great achievement in panoramic photography. There are seven impressions from 15 × 12 plates, all carefully joined, and of equal tone. The point of view is "Tasso's Oak," and the panorama gives us an excellent idea of Rome at the present day.

The British part of the Photographic Exhibition in Dublin might be very properly denominated an enlargement of the Society's exhibition now open in Conduit Street London. Nearly all the principal exhibitors there have sent duplicates of their chief works to the Dublin Exhibition. There is Robinson's beautiful picture of "Brenda," his "May Gatherers," "Sunshine," "Autumn," "Somebody Coming," "Bringing home the May," &c., all old and familiar pictures, every one of which we have seen before. Robinson himself in his study—a beautiful piece of photography, even to his black velvet coat. Blanchard also repeats his "Zealot," and other subjects, and sends a frame full of his exquisite stereographs. England also sends some of his charming stereoscopic pictures of Switzerland and Savoy. Bedford's contribution is much the same as his pictures in the London exhibition. Among them are his lovely Warwickshire pictures. Wet-plate photography is well represented, both in landscape, portraiture and composition. Among the latter, Rejlander is most prominent. One frame containing some pictures showing the "expression" of the hands, illustrates Rejlander's artistic knowledge and ability more than many of his other pictures. None but a thoughtful and accomplished artist could have disposed of those members in such a skilful manner. His pictures of "Grief," "The Mote," "The Wayfarer," "'Tis Light within—Dark without," and his "Home, Sweet Home," reveal exquisite feeling in his treatment of such subjects. Thurston Thompson also exhibits some of his fine reproductions of Turner. There is "Crossing the Brook," and "Childe Harold's Pilgrimage;" but a much larger collection of these beautiful copies of Turner's pictures are now on view at Marion's in Soho Square.

Dry-plate photography is exemplified in all its phases from the oldest form of albumen alone to the latest modifications with collodion, collodio-albumen, Fothergill, tannin, malt, &c. The most prominent and largest contributor to this department is Mr. Mudd. In addition to the duplicates in the London Exhibition, he sends a few others, the most remarkable of which is a large view of "Borrowdale," a noble picture, exquisitely treated, showing masses of light and shade and pleasing composition which stamp it at once as a work of art.

Mr. G. S. Penny exhibits some very fine examples of the tannin and malt process. They are soft and delicate, and possess sufficient force to give powerful contrasts when necessary. Mr. Bull's tannin and malt pictures are also very good; his "Menai Bridge" particularly so.

The Amateur Photographers, both wet and dry, make a good show. And among the Irish followers of our delightful art are Sir J. J. Coghill, who exhibits twelve very pretty views of the neighbourhood of Castletownsend. Dr. Hemphill, of Clonmel, also exhibits a variety of subjects, many of them pretty compositions and excellent photography.

Dr. Bailey, of Monaghan, contributes both landscapes and portraits of very good quality. Mr. T. M. Brownrigg shows 17 photographs, all excellent examples of the wet collodion process. Many of them are exquisite bits of photography, and evince an amount of thought and care in selecting the best point of view, arranging the lines of the subject, and catching the best effect of light so as to make them pictures, which is seldom attended to by professional photographers.

(To be continued.)

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ON A NEW VERY RAPID PAPER FOR ENLARGED POSITIVES.

BY DR. VAN MONCKHOVEN.[*]

It is well known to photographers that paper prepared with a chloride and sensitized in the usual manner yields proofs which vary in colour according to the nature of the sizing of the paper. That, for example, a very pure paper, free from sizing, gives grey and dull pictures, while the same paper, sized with gelatine or albumen, yields brilliant proofs, of a colour very agreeable to the eye. In this latter instance there is in the substance of the paper, beside chloride of silver, a kind of *lake*, formed by the combination of the sizing with the nitrate of silver employed in sensitizing.

Light, in acting upon chloride of silver, decomposes the latter into a metallic silver mixed with a violet chloride, of which, thus far, chemical analysis has not clearly established the composition. The silvery lake, on the contrary, decomposed by light, does not exhibit any traces of metallic silver. The hyposulphite of soda employed for fixing leaves on the unsized paper proof metallic silver only, the aspect of which is grey and dull, while upon paper sized with albumen or gelatine, we find, after fixing, metallic silver, together with the kind of lake mentioned above. From this arises the beautiful colour of proofs upon paper sized with gelatine or albumen. If we stop the action of light upon a paper positive long before the picture is printed, and then continue the action by means of a dilute solution of gallic acid, a moment soon arrives when the proof assumes in the bath a colour as deep as when under the prolonged influence of the light alone. Fixed in hyposulphite of soda, however, the proof is much more grey and dull, as the sizing is less abundant in the substance of the paper.

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[*] Read before the French Photographic Society, and printed in *Le Moniteur de la Photographie.*

For, if we sensitize two sheets of paper, the one with a chloride alone, without the addition of sizing, and the other with albumen alone, without chloride of sodium, it is quite evident that the first paper contains chloride of silver only, and the second an albuminate of that metal. These two papers, slightly exposed under a negative, so as to print a very weak positive, then developed by gallic acid, present a widely different aspect. The first will be grey and dull, the second, though yellowish in its substance, will exhibit a picture of a very beautiful colour. Fixed with hyposulphite of soda and dried, the first, on unsized paper, will still present a grey and dull image, soluble in mercury, and formed of metallic silver; the second, on sized paper, gives a coloured picture insoluble in mercury.

In the first experiment we perceive that the gallic acid, in developing the picture, adds metallic silver to it; it is an actual intensifying, and not a true development that takes place. Upon the albuminate of silver, on the contrary, a real decomposition takes place.

Unfortunately, papers sized with resin, gelatine, and albumen, turn yellow in the gallic acid bath, and the hyposulphite of soda removes a little of their colour. Besides, the process by development is generally abandoned for the process of direct printing. I should, therefore, have nothing new to add to this process without the observation of a fact resulting from a study I have made of the decomposition of collodion.

Some two or three years ago I discovered and published the fact that the decomposition of collodion is effected by the absorption by alcohol of the nitrous elements of gun-cotton; the alcohol passing to the state of nitric ether, the gun-cotton to the state of a peculiar resin. Thus, simple collodion kept several years yields deep red pictures.

A substance akin to nitrated cotton—nitrated sugar—is decomposed much more rapidly in presence of alcohol, and gives, under the influence of light only, in presence of an excess of nitrate of silver, be it understoood, a brown substance, exactly as albumen does; and what is very remarkable, instead of yellowing under the influence of gallic acid, like albuminate of silver, this substance remains white.

Now, paper immersed in an alcoholic solution of decomposed *nitrous sugar*, dried, sensitized, and exposed for a moment to the light under a negative, then immersed in gallic acid, soon gives a picture of a magnificent colour, similar to that of proofs upon albumen, and, like them, may be toned and fixed without losing the fine aspect it exhibited in the developing bath.

I now proceed to describe my process: –

I commence by preparing the *nitrous sugar*, by placing one part of pulverized sugar in a mixture of one part of sulphuric acid, and one part of monohydrated nitric acid. After an action of about five minutes' duration I remove the mass out of the acid, and wash it under a stream of cold water. I next dissolve it in alcohol and precipitate it with water. I thus obtain a white glutinous substance, which is nitrous sugar. I may add that it is a very delicate preparation, and that in the absence of a discovery I have made of a simpler method of preparing it, my process of preparing positive paper would not have been practicable.

I dissolve 20 grammes of this nitrous sugar, (or nitroglucose as it is termed in pure chemistry), in a litre of alcohol, and, when dissolved, I close the bottle with a ground glass stopper, and place it in a sugar refiner's stove, which marks a temperature of 110° Far. during 8 or 10 days. At the expiration of this time all the nitro-glucose is decomposed, and the liquid, which, upon first being prepared, did not cloud a solution of nitrate of silver, now produces a white precipitate which blackens with extreme rapidity in the light.

The alcoholic liquid is poured into a porcelain dish, and the sheets of paper passed through it one by one, and suspended to dry. I employ indifferently *papier Rive*, and for proofs of large dimensions, ordinary drawing paper, which I buy by the yard.

The paper dries in a few minutes. I then immerse it for two hours in an ordinary salting solution (10 per cent.)* and then hang it up to dry.

I can preserve the paper in this state, but I generally prefer to sensitize it at once, and keep it sensitized. To this end I simply pass it on to a solution of nitrate of silver (5 per 100); then hang it up to dry, and keep it for many months ready for use.

The extreme sensibility of this paper and the colour it assumes under the influence of light are very remarkable. As to its rapidity, all I can say is, that yesterday I took 24 enlarged pictures from the same negative within an hour. Each enlargement, measuring 19¼ inches by 23¼, has been printed, with my apparatus, in a single minute in the sunlight, and the rest of the time has been employed in changing the paper in the printing frame. Under an ordinary negative, in less than ten seconds in the sun, the picture is sufficiently distinct.

The colour assumed by the paper under the influence of light is a lighter and redder voilet than that given by ordinary chloride of silver.

When there are a great many proofs they are all immersed together in a bath formed of 1 gramme of gallic acid to a litre of water, and 10 cubic centimetres of glacial acetic acid. The proofs assume a magnificent colour, and, I repeat, are in every respect comparable to the finest proofs upon albumen.

After development, the proofs are toned and fixed in precisely the same manner as in the ordinary process. Dried, the proofs are coated with a varnish of gum, wax, or other substance.

I think that this process will render the question of enlargements quite practical. In fact, I have printed upon this paper from very intense and varnished negatives taken several years ago, in less than five minutes in the sun. With a transparent negative made expressly for enlarging, and with my large apparatus, a double sheet is printed in two minutes, a single sheet in one.

The silver baths being weak, there is in that particular a great economy.

Lastly, when, during winter, photographers can at present take only one or two proofs a day from their negatives, they will be able to take three hundred or more. The pictures are not in the substance of the paper, like those obtained by development, but rather on the surface.

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ON PHOTO-BINOGRAPHY.

BY E. PETTITT.†

If we glance at the past history of photography, we cannot but observe that the discovery of the illustrious Frenchman has been followed up with a diligence and a success unparalleled in the history of any other art or science; every advance has been a distinctive step, and has left a footprint behind it for the guidance of all who follow and desire to explore the wonders of its yet untrodden domains.

These distinctive steps may be classed, for the most part, as notable discoveries in chemistry, mechanics, and optics. Daguerre, Talbot, Archer, Wheatstone, Brewster, have become illustrious in the annals of our art, because their ideas were practical, and could be grasped by those industrious and intelligent workers who, following, have filled in the minute details, and have rendered the discoveries of the philosophers available and useful to society; and it is as one of these "busy bees" that I have been buzzing in and out of that wonderful toy, the stereoscope, and, while admiring its wonders, have been trying to make it as useful as it is beautiful. Whether "binography" will prove a pot of honey I leave to time to decide; but my aim will be attained if I succeed in drawing the swarm to the pot, to taste and try for themselves.

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* This large proportion of salt is surely an error.—Ed.

† Read at the Photographic Society, June 13th.

The "binograph" is produced without the aid of any special process, and differs only from the ordinary photograph in its optical value. Two lenses instead of one are used, and the resultant images, coalescing, become one picture.

As nature has blessed us with two eyes to enable us to see things as they are, and to judge of distance and form, I hold that if we are to produce a true likeness of her form and feature on our sensitive plate, our camera must look at her with two lenses; and if we want absolute truth, these must not be further apart than the distance at which she has placed our eyes. For, however charming may be the exaggerated perspective we behold in the stereoscopic landscape, we may judiciously hesitate ere we attempt the distortion of the human face.

The optical value gained by the "binograph" over the ordinary photograph consists in the infinite elaboration of the pictures (the production, in fact, of what an artist would call "quality"). The lines of the different perspectives due to the angle at which each picture is taken, falling upon and coalescing, round off and soften each other, supplying those tender gradations of light and shade which make a finished picture, instead of a coarse, hard-outlined sketch, which the single lens, however good, must always produce in life-sized pictures. And we must acknowledge, at least to ourselves, that the hideous enlargements of life we see from time to time can never adorn our drawing-room, or be handed down to our children as things of beauty.

The two pictures before you are from the same negative; one of them is a "binograph," the other a single picture. The manipulative conditions and exposure are the same in each case; and I think they will speak for themselves. They were taken at a distance of about seven feet from the sitter; and here I may remark, that in all life-sized pictures it is necessary, if you desire to see them to the best advantage, not to get nearer to them than the distance at which the lens was placed when the picture was taken.

Lenses having a short focal distance, therefore, are required for the binographic life-sized portrait, for two reasons: the first is, the convenience of being able to see them with proper effect in a moderate-sized room; and the second, that the nearer you can get to your sitter, the more marked is the projection and relief of the binographic picture.

Of course there are a good many conditions necessary to be observed in the production of binographs. Mr. Ross, the eminent optician, who made my instrument, succeeded on the first attempt, and produced the perfect thing. This instrument so made, and properly used, precludes all possibility of failure, and renders the operation indeed as simple as that by the single lens. At some future time, with Mr. Ross's permission, I may have an opportunity of going fully into the details of the process, and the optical conditions necessary to success; for the present, I may generally describe it as one of great simplicity. A stereoscopic negative is taken of the sitter in the usual way. When fixed, it is replaced in the slide; the camera is now placed at a window, and all light excluded, except that entering the room through the double negative; *we now find that, at the distance from the lenses at which the sitter was originally placed, the two pictures coalesce and become one life-sized binograph.*

There is no necessity for solar camera or expensive fittings; a hole in the wall or in a window-shutter opening against the sky, and an artist's easel to hold your plate at the proper angle, are the extra apparatus requisite, and, having a double volume of light upon your sensitive surface, a very few seconds will do the work. The picture before you is an instantaneous one, and was produced and framed as you see it in less than half an hour, at a cost, minus the frame, of about 5*s.* 6*d.* It is a transparent print on glass, coated with plaster of Paris, which forms the lights of the picture, cements it into the frame, and protects it from injurious atmospheric influences. Of course, if desirable, binographic negatives can be as easily produced, and paper prints obtained, in the usual way.

In conclusion, I may say that I believe the art is yet in its infancy, and that at no distant date we shall see imperishable cartoons on large plates of glass that have passed through a furnace at white heat. This can be done, if we have but the courage to try. The small plates I have here have passed through such an ordeal. In one of them, indeed, the glass itself has been in a state of fusion; but the photograph is undamaged.

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ON THE APPLICATION OF PHOTOGRAPHY TO THE CONTINUOUS SELF-REGISTRATION OF MAGNETIC AND METEOROLOGICAL PHENOMENA, AS PRACTISED AT THE ROYAL OBSERVATORY AT GREENWICH.

BY THOMAS W. BURR, F.R.A.S., ETC.*

In the original arrangements of the observatory, all these instruments were observed every two hours, and on certain days in the year at every hour, which, in addition to other work of the department, fully employed Mr. Glaisher and several assistants, and was monotonous and wearisome in the extreme, as, unlike the astronomical assistants, bad weather brought them no relief of their labours. Even assuming that the observations were punctually made, it is obvious that many most important phenomena might escape notice during the two hours' interval, especially in the case of magnetic storms, and some system of continuous and automatic registration became a great desideratum. Photography was at once looked to for the required assistance, and to the inventive talents of Charles Brooke, Esq., F.R.S., the eminent surgeon and microscopist, we are indebted for the plan adopted about the year 1846, and which has since been in constant operation for the registration of the magnetic instruments we have described, as well as the barometer and thermometers.

The photographic process employed is a paper one, and, waiving for the present all details of its preparation, we will first consider the mechanical arrangements of the apparatus. The sheets of paper, when properly sensitized, are wrapped round glass cylinders, which are, in fact, the ordinary glass shades used to protect works of art. Those used are 11½ inches long and 14½ inches round. Each shade is cemented into a brass cap having a spindle projecting from the centre. This pin and the hemispherical end of the cylinder rest on friction rollers in the case of a horizontal cylinder, and a wire from the spindle, bent into the form of a winch, rests in a hole in the hour-hand of a strong time-piece, by which it is made to rotate smoothly in twenty-four hours. In the case of a vertical cylinder the time-piece is placed below the glass shade, the arrangement for rotating it on its axis being the same. After the prepared paper is rolled round the cylinder, it is covered by another shade slightly larger, and the two are made to fit by wet tape round the mouth, and some damp wadding is also placed in the spherical end of the shade to keep the paper moist. The registration of the magnets is effected by allowing a beam of light, from a very narrow slit in the chimney of a gas-flame placed a little out of the line joining the magnet and the revolving cylinder, to fall on a concave mirror carried by a part of the apparatus, suspending the magnet and, of course, moving with it. This causes the beam of light to converge nearly on the centre of the cylinder about twelve feet off, where it falls upon a plano-convex cylindrical glass lens, having its axis parallel with the axis of the cylinder, by which the image of the slit is reduced to a neat spot or pencil of light. The magnet, moving in azimuth, produces a spot of strong light, which runs along this lens, and, as the paper revolves under it this light, by its actinic power, produces a continuous line round the cylinder, deviating to the right or left, and thus indicating the horizontal motions of the magnet.

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* Continued from p. 282.

A diagram of the apparatus will render this more intelligible. In the accompanying drawing (fig. 1), only the principal parts of the arrangement are represented; A B is the magnet, C the cylinder, D the time piece, E the flame, F the mirror, G the cylindrical lens, and H the photographic trace. Originally, camphine lamps were used for the photographic light; but for many years past, naphthalized gas has been substituted, and is equally efficient, while much more manageable and cleanly. The gas, previous to burning, passes through a box divided into compartments containing naphtha, which is kept gently warmed by water beneath it heated by a small flame.

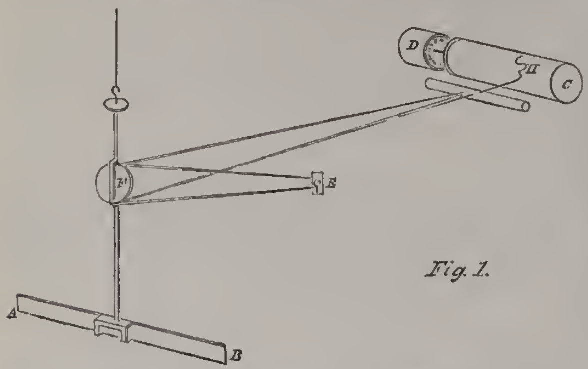

Fig. 1.

Each cylinder is covered with a double case of blackened zinc, having a slit in the direction of its axis, vertical or horizontal, as the case may be, in front of which is placed the cylindrical lens. The whole course of each beam of light, from the flame to the magnets, and thence to the cylinders, is also enclosed in tubes of blackened zinc, keeping out all extraneous light.

As neither the glass cylinders can be expected to be very perfect in shape nor to rotate very symmetrically, nor the paper to be always exactly alike in size, the following contrivance to obtain a base-line from which to measure the departure of the curve is used. A separate gas flame is placed so that its light, reflected by a prism through a small cylindrical lens on the top of the cylinder, forms another spot of light on it, which remains stationary; and as the paper travels this prints a strong line round the cylinder, which, when the paper is unrolled, becomes the base from which the distance of the curve can be measured, and its value estimated as next to be described.

In order to read off the indications thus obtained, and translate the photographic curve into ordinary language, observations are made with the theodolite in the old way, four times a day, and these give the value of the indications of the curve at those particular times, from which the value of other distances of the trace from the base-line can readily be measured by means of a scale drawn upon pasteboard. The length of the paper being not always alike, and the going of the clock likewise slightly irregular, it is necessary to have a time scale as well, instead of simply dividing the paper into hourly parts. This is effected by shutting off the light occasionally for a few minutes from the cylinder, which, of course, leaves a white spot in the curve, and the interval between two such operations being accurately noted, gives the time equal to a certain length of paper, and to divide this readily an ingenious expedient is adopted. A slip of vulcanized india-rubber is stretched in a frame which, by a screw, will lengthen or contract the slip, and the scale being marked on the india-rubber, it can be altered so as to make its divisions correspond with the value of the length of time measured by two breaks in the curve on the paper.

With respect to the absolute length of the photographic traces, it may be mentioned that a variation of 1° in the declination magnet is measured by 5 inches on the cylinder, and that a variation of 1000th part of the horizontal force covers about ¼ of an inch on the paper, and the same variation in the vertical force about ½ an inch.

The same cylinder is made to record the indications of two instruments, by being so placed that the light from each falls on different sides of it, the base-line being made between them. The declination magnetometer and horizontal-force magnetometer record their variations on one horizontal cylinder, and the vertical-force magnetometer on a vertical cylinder, which also receives the trace of the barometer obtained in the following manner:—

The instrument is a large bore one of the syphon form, having the lower surface of the mercury more than one inch in diameter. This surface supports a glass float, from which rises a vertical rod. This rod is connected at right angles with a long and light lever, the greater part of the weight of which and of the float is counterpoised, leaving a small residue only pressing on the mercury. The barometer is about 30 inches from the cylinder, and the fulcrum of the lever is still further off. The lever carries a plate of opaque mica in front of the rotating vertical cylinder, having a small hole in it, through which the photographic light of a gas jet, concentrated by a cylindrical lens, passes, and records the rise and fall of the barometer, which, by the action of the lever, is increased four times in length, rendering the indications easily read off. An independent pencil of light, shining through a fixed aperture, traces a base line, from which the heights are measured, a few eye observations being made to obtain fundamental points.

The annexed diagram (fig. 2) shows this apparatus in detail. A B is the barometer, C the cylinder, D the time-piece, E the vertical rod, F the fulcrum, G the counterpoise, H the lever and mica plate.

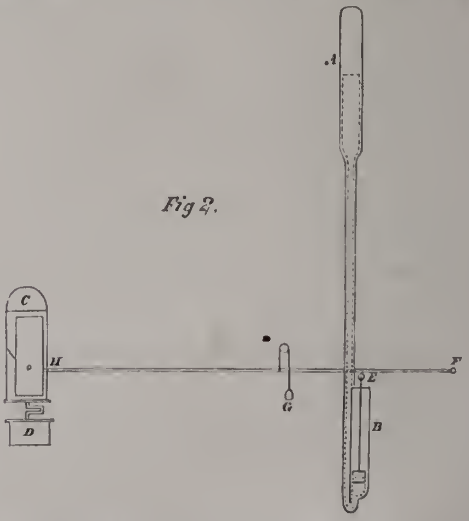

Fig 2.

Another vertical cylinder, placed under a shed in the grounds of the observatory, photographically records the readings of dry and wet bulb thermometers by a very simple arrangement.

The thermometers are mercurial, and have large bores nearly half an inch in diameter. Fine wires are placed at every degree across a plate, which has a slit in front of the mercury column, with thicker wires at every 10°, and extra ones at 32°, 52°, and 72°.

The light of a jet of gas is condensed by a cylindrical lens upon the thermometer tube, and as the mercury rises or falls it obscures or uncovers the sensitive paper, and leaves a broad photographic trace on each sheet, which shows the height of the thermometer, and the exact degree can be read from the spaces of light produced by the intercepting wires. This cylinder is larger than the others, being 13½ inches long and 19 inches in circumference; it rotates once in 48 hours, and requires no base-line.

(To be continued.)

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, June 21st, 1865.

An International Photographic Exhibition will take place in the *Palais de l'Industrie* at Amsterdam, in conjunction with an Exhibition of the Fine Arts applied to Industry. The exhibition will be open for two months from the 1st of August next, and it will embrace every branch of the art of photography—portrait, landscape, architecture, reproduction, &c.; the application of photography to science, to art and manufactures; photolithography, heliography, photosculpture, photography on porcelain, glass, enamel, &c. Applications for space must be addressed (free) to M. J. A. Van Eyk, Dir. Sec. du Palais de l'Industrie, before the 1st of July.

The photographic world will hear with regret of the death of M. l'Abbé Despratz, in his 57th year. The services rendered to our art by this humble country curate form an important chapter in the history of photography. He was the first to introduce resinous substances into collodion with the view of obtaining dry plates, thus opening a new path to experimenters, which has greatly contributed to the present state of perfection. His communications were remarkable for the profoundness of the knowledge displayed, and for the lucidity with which they were expressed.

Dr. Van Monckhoven's communication on a new rapid positive paper for enlarged proofs will be read with the interest commensurate with its importance. M. Vilette has also communicated a process of printing on collodion for enlarged positives. He states, "The object of my communication is to make known that the process of transferring collodion is also a sure means of obtaining enlarged positives; I have practised it about ten years, and so constant is my success, that I have never thought of employing any other method. The advantages it presents are:—

"1st. An extremely delicate proof, due to obtaining the picture direct, and also to the very nature of the collodion.

"2nd. Undoubted stability, as the system rests upon the negative process.

"3rd. The picture is always *on the surface*, contrary to certain paper processes, in which development with gallic acid produces the opposite result.

"4th. A very short exposure, especially if the sun or the electric light concur in the production.

"To enlarge a negative head of three-fourths of an inch diameter to the size of nature, two or three seconds suffice in the sun, or with the electric light: the oxyhydrogen light requires an exposure of two or three minutes. The diffused light of a clear day gives a picture in seven or eight minutes; this is the maximum time of exposure I employ on the average; and with negatives unsuited for printing paper positives, but vigorous nevertheless—for this process requires strong negatives—grey by transmitted light. It sometimes happens that with a weak negative I obtain a picture life-size in two minutes by diffused light.

The processes I employ have been published by M. Moitessier, who was the first to practise this method of taking proofs. Experience has led me to substitute, in the toning, chloride of gold for bi-chloride of mercury, and gelatined paper for porcelain card. I operate in the following manner:—I take iodized collodion, sufficiently thick, which, by a preliminary experiment, has given a good positive on glass, and sensitize it in a bath of crystallized nitrate of silver, and then proceed to pose. I develop with pyrogallic acid; the picture should appear as slowly as when developing a negative. Stop the developing when the picture is judged satisfactory, wash it well, and fix it with cyanide of potassium of three per cent., wash again, and proceed with the toning, which is rapid, with a solution of chloride of gold, strength 1 per 1,000, or with bichloride of mercury, as suggested by M. Moitessier. Wash again, then apply the sheet of gelatined paper upon the collodion film, turning up the edges. The collodion is detached with the greatest facility, whatever the size of the plate. I have pictures 5 feet by 3 feet, several heads larger than nature; and everything with me, enlarging or reducing, is performed by the same process."

Several members of our Photographic Society object to the system hitherto adopted in the election of officers. Messrs. Bingham and Ladrey point out the inconvenience that results from presenting ready-made lists to the members to be used as voting tickets. When the time arrives, for example, to renew the *bureau* or the several committees, these lists, prepared before hand, always contain the same names, because, in fact, the members are re-eligible: it is true that any member can make such alterations as he thinks proper, but as no other list of candidates is prepared beside the official list, and as the elections always take place at an ordinary meeting, the privilege of altering the list of candidates is rarely exercised, and the result is that the same persons are always in possession of the same offices. Now, it would seem preferable to announce in the Society's *Bulletin*, a month in advance, when the elections are to take place, and to invite members to nominate fresh candidates. Something to this effect will doubtless take place in future; it is a right step, to protest against the present monopoly of official functions.

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PHOTOGRAPHY IN FRANCE.

Sir,—I am happy to begin this correspondence with an interesting communication which the French Photographic Society has just received from Dr. Van Monckhoven.*

The subject is a printing process which is based upon an entirely new principle, and the remarkable results of which the members of the Society were enabled to appreciate. I will endeavour to give you as complete an analysis of it as possible.

You commence by preparing *nitrated sugar*, which is done by placing a portion of pulverised sugar in a mixture consisting of one part sulphuric acid and one part monohydrated nitric acid. After five minutes' action the mass is taken out of the acid, and washed under cold running water; it is then dissolved in alcohol, and precipitated by water. The substance thus obtained is white, sticky, and very delicate. Had it not been for the author's discovery of a simpler mode of preparation, he believes that his process for preparing the paper would never have been practical.

Twenty grammes of this nitrated sugar (or *nitro-glucose*, as it is called in chemistry) are dissolved in a litre of alcohol. The bottle containing the solution is then closed with a roughened stopple, and is left for eight or ten days in the claying-house of a sugar-refinery, where the temperature is about 43° centigrade. At the end of this time all the nitro-glucose has decomposed, and the liquid, which at the commencement of the preparation had no disturbing effect upon nitrate of silver, now produces in it a white precipitate which darkens with extreme rapidity in the light.

The alcoholic liquid is poured into a porcelain basin, and one by one the sheets of paper are placed and suspended in it. The author uses indifferently Rive's paper, and, for very large pictures, common drawing-paper, which he buys by the metre.

The paper is dry in a few minutes; it is then left for two hours in an ordinary solution (one part salt to ten parts water), and afterwards hung up to dry.

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* Our translation of Dr. Van Monckhoven's important paper was in type when we received this letter; but our readers will have pleasure in reading M. Lacan's interesting analysis of it.

You may keep the paper so, but it is preferable to sensitize it at once, and to preserve it sensitized. For that, you have simply to put it into a solution of 5 grammes of nitrate in 100 of water, and then to dry it by suspension. In this manner it may be kept ready for use for several months.

What is remarkable is the extreme sensitiveness of this paper, and the colour it takes under the influence of light. As to rapidity, Dr. Van Monckhoven has in one hour made 24 amplified pictures of the same *cliché.* Each picture, 48 centimetres by 59, was taken in one minute of sunshine, by means of the dyalitic apparatus, and the rest of the time was employed in changing the paper on the *châssis.* Under an ordinary *cliché* the image is sufficiently marked in less than ten seconds of sunshine.

The colour which the paper takes under the luminous influence is a very light violet tint, redder than ordinary chloride of silver.

When you have a large number of pictures, you put them all together into a bath formed of one gramme of gallic acid per litre of water, and ten cubic centimetres of crystallizable acetic acid. The pictures take a beautiful colour, comparable to that of the finest pictures upon albumen.

After development, the papers are toned and fixed, precisely as with the ordinary process. When dry, the pictures are coated with gum and encaustic or varnish.

The author thinks that this process will render the question of amplification a thoroughly practical one. In fact, he has, on this paper, amplified very intense varnished *clichés* made several years before, and that in five minutes of sunshine. With a transparent *cliché* made expressly for amplification, and the large apparatus, a double sheet can be printed in a couple of minutes, and a single sheet in one.

The silver baths being weak, there is, under this head, great economy.

Lastly, photographers who, during the winter, can get from their *clichés* but one or two pictures per day, will now be able to do more than three hundred.

Dr. Van Monckhoven placed before the members present a collection of pictures, some of which were printed from ordinary *clichés,* and others by amplification.

These pictures leave nothing to be desired; they are comparable with the finest taken upon albumen. The image is not *in* the paper, as with those obtained by development, but on the surface.

At the same meeting M. Villette made some very interesting experiments to show the advantages of the Moitessier process applied to photographic amplification.*

This procees and the specimens accompanying it were received very favourably. Ernest Lacan.

Paris, June 20, 1865.

A WORD OR TWO ON "BLURRING OF THE IMAGE" AND ITS REMEDY.

Sir,—Whatever may be the precise conditions under which blurring occurs, I presume most persons are agreed in referring it primarily to pencils of light reflected in such a manner as to re-impinge on the photographic picture. At all events, the attempts made to overcome the evil, by the interposition of an absorbent or non-actinic surface between the sensitized plate and shutter of the dark slide, would seem to countenance this view; whilst the very partial success which has been achieved induces me to hope that the remedy about to be proposed may not prove unacceptable to your readers.

I need scarcely observe that the effect of employing any opaque surface behind the collodionized film must necessarily be to cause all unabsorbed rays, excepting those that fall perpendicularly upon it, to re-enter the film at points not coincident with those at which they originally entered—in short, at more or less of an angle. Without asserting that the tendency to this evil can be altogether got rid of, it appears to me that it may be reduced to a minimum by forming the central portion of the shutter of the dark slide of orange or ruby-coloured glass, in order that the rays of light, after having performed all the work demanded of them, may be permitted to escape, instead of returning and thereby rendering the photographic image confused. For, however much the rays may be refracted on entering the coloured transparent medium, such rays must necessarily be refracted at too great an angle to re-enter the picture; and, so long as no opaque surface exists behind the sensitized plate, the amount of reflection due to the polished surfaces of glass will be, comparatively speaking, unimportant.

But other advantages are secured by this means. These consist in our being enabled, by the simple expedient of inserting a non-actinic glass-disc into the cap of the lens, to focus the picture upon the collodionized surface itself, and thus ascertain whether the visual and chemical foci coincide, the loss of light being the only difficulty we have to contend against in the operation.—I remain, Sir, yours very faithfully, G. C. Wallich.

MAGNESIUM AND OTHER ARTIFICIAL LIGHTS.

Sir,—I have to call in question the conclusions drawn by "W. H. Olley" respecting what he terms the communication of the "remarkable photogenic power" of the magnesium light "to the light of ordinary flames."

In the first place, he argues that, because on exposing a plate before a lighted candle or gas, he gets an image of it; *therefore,* it was because he took the precaution to burn a small slip of magnesium wire four feet from the candle, which thereby assumed a "lurid, reddish hue;" and, *consequently,* became more actinic. Did he ever try a candle *without* the wire, but illuminated by daylight? If so, does he suppose that "the chemical rays emanating from the" said daylight "were reflected, as it were, by the solid particles of carbon suspended in the flame," and "in proportion to the number of such particles?"

Secondly, is not the very fact that "not the least trace of the body" of the candle "was visible in the photograph" he took a sufficient proof that the image was not the result of the bit of magnesium wire at four feet distance, but due to the light from the self-illumining object itself? for surely, if "solid particles of carbon" could reflect the distant wire-light and give a picture, there were abundance of "solid particles" in the "body of the candle" to effect this result!

Thirdly, if, as your correspondent supposes, the brightness of the magnesium flame is occasioned by the floating particles of oxide in it, "the practical application of the fact" *is* "very obvious." He has only to put a pinch of magnesia in his candle-flame to obtain all the results of the "fickle, dazzling, and unmanageable magnesium light, when directly employed." If Mr. Olley will try this experiment, which will also, I have no doubt, be quite "novel," I can guarantee that he will be able to obtain an image of the candle-flame "half-an-hour after" quite as readily as in the case he mentions, where a "bead of magnesia" had been used.—I am, &c., R. H. P.

ANILINE COLOURS FOR PHOTOGRAPHS.

Sir,—In answer to your invitation, I beg to offer my testimony to the general permanency of aniline colours applied to photography when submitted to the tests of ordinary exposure to light, such as hanging up in rooms or placed in albums.

Over *two years* ago, I made some experiments in colouring photographs with the aniline colours, with the view of testing their permanency and utility. I tinted six cartes de visite, three of which I framed and hung up inside exposed to the light of an ordinary room, and subject to the fumes of photographic chemicals as well; the other three I framed and placed in the window; exposed them to a very strong light, reflected sunshine during most of the day, and direct sunshine in the afternoon. As might have been expected, the colours bleached more or less in the course of one summer. Those kept inside are as bright as they were at first. I also had some pictures coloured by an artist, to test how far the aniline colours could be used in combination with the ordinary water or miniature colours. That experiment was equally successful. By a single wash with the aniline colours the artist could get more brilliancy than with three or four washes with the ordinary water colours; and by glazing the shadows and heightening the lights, he could produce his desired effects in much less than half the usual time. These specimens have been in an album, handled by everybody for over two years, and I cannot see the slightest change in their appearance.

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* In this process a transparent positive taken on glass is transferred to paper.—Ed.

I shall have much pleasure in submitting these specimens to you, to judge for yourself, and see how much those that were exposed to sunshine have lost, for parts of the pictures were protected, and those parts are (as near as I can see) the same tint as at first. It is absurd to submit photographs, or colours applied to them, to such a severe test as sunshine; but people seem to think, because light produces a photograph, it and everything connected with it ought to be tested by sunshine to determine its durability. No one would like to submit a dyed ribbon, a printed muslin, a water-colour drawing, or an oil painting to such a test as sunshine, to prove their permanency; and why a photograph?—Yours truly, J. Werge.

379, *Oxford Street*, *June* 14, 1865.

[Mr. Werge has submitted the specimens in question to our examination, and we have pleasure in endorsing his remarks.—Ed.]

Sir,—Seeing this week in your paper an enquiry respecting the permanency of aniline colours, I beg to inform you that I have made very extensive experiments, and can speak confidently on the subject. For photographs, unless kept in the dark, they are worse than useless. In sunlight they will fade in one or two days, and in ten days will almost completely disappear, leaving only a kind of dirty smudge, even if laid on in a large quantity.

Permanent oil and water colours exposed ten days to the same sunlight were not changed in the least.

The aniline coloured photograph will also fade in an ordinary lighted room in a few weeks, especially the light and delicate flesh tints.

The reason that the coloured ribbons upon the specimen cards do not so quickly fade is probably due to the fact of their being completely saturated; but if the ribbons had been cut in half, and one half kept in the dark, I think your correspondent would have found that the halves kept in darkness would at the end of the year be much brighter than the exposed halves.—Yours truly, W. Callaway.

Bristol, June 10.

PHOTO-BINOGRAPHY.

Sir,—I shall esteem it a favour if you will permit me, through your columns, to reply to the remarks made by Mr. Mayall, Mr. Le Neve Foster, and Mr. Hughes, after the reading of my paper on the above subject, on the 13th inst. Mr. Mayall stated that he had exhibited at the Polytechnic enlarged superposed binocular pictures years ago, and that, therefore, the idea is not new." Now, our lenses are very much improved since that time, and what Mr. Mayall of years ago could do then he can surely do now, especially with the light I have thrown upon this new and interesting subject. Well, if he can do now as he says he did then, I offer to share the honour with him, and, more than this, I now give him the conditions necessary to ensure his success.

1st. He must work with a pair of lenses that shall cover the lower subject within a distance from it of twelve feet, six feet being better than twelve.

2nd. And provide a screen at least as large as his subject. I think, however, that Mr. Mayall, on enquiry, will find that although he may have presented stereoscopic slides for use in the oxyhydrogen lantern, that only one picture was enlarged.

Mr. Le Neve Foster stated that "if two images were really different, they could not blend accurately, and could result only in an imperfectly defined image if they were identically the same, no possible good could arise from their use, but in neither case could stereoscopic relief be produced in a single picture. Now, these assertions of Mr. Foster are untrue, and I can prove them to be so. I refer him and all who think with him to the centre picture of three (binographs) now in the London Photographic Society's Exhibition, in Conduit Street. I am sorry it hangs where it cannot be seen, but if he will use his influence I have little doubt it could be lowered a yard or two; this done, he will find that the "optical fact" will put its head out of its frame and look his theory down. A respectful distance, an opera-glass, or a couple of paper tubes, and a pair of eyes—not two odd ones—are all the conditions necessary to be observed, and he will in this picture see all his impossibilities realized.

The same remarks apply to Mr. Hughes's observations and impossibilities. He will find the binographs will relieve his brain of the trouble of blending the two pictures, the work being already done; and I may add, for his information, that the "blending process in a binocular vision takes place in the commissure of the optic nerve, and that the brain is merely informed of the operation by the continuation of the nerve-branches beyond this function to the brain."

The picture alluded to was taken at a distance of about four feet from the sitter, the lenses 2½ inches apart; it possesses, therefore, about three degrees of binocular parallax.

In conclusion, I may say that a scientific fact can neither be written or talked down, nor frowned or coaxed into obscurity; and I hope this matter will receive the careful consideration and examination of all who believe in our art-science as something better than Mr. Ruskin has set it down.—I am, Sir, yours truly, Edwin Pettitt.

Birmingham, June 20, 1865.

Photographic Notes and Queries.

Toning with Gold and Carbonate of Magnesia.

Sir,—Presuming that the member of the North London Association who, at page 285 (No. 354) of the Photographic News, is reported to have stated that he had successfully used a toning-bath containing carbonate of magnesia, is a subscriber to your Journal, may I be permitted to request, through that useful publication, that he will have the goodness to state the quantities of carbonate of magnesia and of water he recommends to be used with a grain of gold? Also, whether they are the only components of the bath, and whether the prints undergo any peculiar preparation?—Yours, obliged,

June 21, 1865. Novice.

[Carbonate of magnesia is very sparingly soluble in water. We believe that in the experiments referred to a portion was agitated with water, which was then filtered, and a portion of the slightly alkaline water added to the solution of gold. Perhaps the member in question will kindly furnish details.—Ed.]

Preparing Sensitive Plates in Daylight.

Dear Sir,—I enclose you a print from a negative, which was prepared according to the method I saw mentioned in your Journal some time ago by M. Poitevin, and still later in the *British Journal* by Professor Himes, in which the plate, being prepared in daylight, washed first in distilled and afterwards in common water, then treated with a solution of iodine, becomes sensitive to light, the iodine at the same time obliterating all previous action of light upon the film. The plate from which the enclosed print was taken I prepared on a sunny morning with the window open, and after washing as usual, exposed to the direct rays of the sun, poured the iodine solution over it, and placed it on the mantleshelf in my dressing room for two days, then took it into the dark room, washed in distilled water, and coated with the usual malt and tannin solution, dried, and exposed for about two minutes, ⅜th of an inch stop—light good—developed with carbonate of soda and pyro, and strengthened with citro-nitrate and acid pyro. From the film being dried before applying the tannin, it (the tannin solution) seems to dry unevenly on the film. This might perhaps be remedied by longer soaking in distilled water, or an application of alcohol. I have not been able to try any further experiments, but intend to try redipping in nitrate bath, exposing wet, and developing with iron. It seems to me the process would be useful to amateurs who have not a dark room handy in a variety of ways.—I remain, dear Sir, yours very truly, J. Bull.

Anglesey Villa, Cheltenham, June 14th, 1865.

[The print which is enclosed by our correspondent is very excellent. We shall have pleasure in hearing of his further experiments.—Ed.]

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Talk in the Studio.

Photographic Fine Art Gallery.—Messrs. Marion and Co., of Soho Square, have just added an interesting feature to their publishing establishment. They have opened a gallery for the display of examples of photography and art combined, chiefly in the form of coloured reproductions from the works of first-class painters, and also popular portraits and subject pictures of first-class photographers. Amongst the latter may be seen, coloured with exquisite taste and skill, Robinson's "Sunshine," "Welsh Girl," "Somebody Coming," &c.; studies by Rejlander; portraits by Mayall, Southwell Brothers, and others. Amongst the reproductions are the magnificent Copies of Turner's Paintings, by Mr. Thurston Thompson, coloured with great care, after the originals; Bingham's copies of Meissonier and other modern painters, and many others. All these are coloured with great skill and taste, the happy judgment not to do too much being carefully exercised. The gallery is hung with framed examples of the extensive selection of this class of works in stock. We think much credit is due to Mr. Bishop, the managing partner of this branch, for the taste and judgment evinced in establishing this adjunct to our art, and affording photographic and art amateurs a ready facility for examining a very charming stock of pictures.

Royal Cornwall Polytechnic Society.—This spirited Society have just put forth their programme for the next series of competitions, in which we perceive photography, always honourably recognized, now take a much more prominent position. The following are the prizes announced in this department:—1. For the best picture showing great photographic skill and artistic taste (any subject), the first silver medal as the premier prize in the department. 2. For the best landscape, silver medal. 3. For the best portrait, silver medal. The pictures in sections 2 and 3 to be from negatives of not less size than 10 by 12 inches, and the prints to be untouched by hand. If vignetted, a full printed picture to be enclosed for the inspection of the judges. A bronze medal in each class, at the discretion of the judges, but the medals not to be awarded if the pictures exhibited are not considered deserving. Competitors may exhibit pictures in each class, but no competitor to take more than one medal. The 10th and 14th rules in regulations for competiton are not to apply to this department. 4. For amateurs only, residing in the county, £1 for the best series of 12 photographs.

Photographing the Orchestra.—At a recent Handel Festival, held at Boston, U.S., a rather ludicrous scene is described by the *New York Tribune*:—"The conductor, baton in hand, mounted his stand and said a few words which we could not catch, and a pause ensued. Suddenly he faced the audience, placed himself in a graceful pose, and remained stationary. At first this ominous pause puzzled me, but suddenly the thought flashed upon me—the whole orchestra was being photographed! My first impulse was to exclaim against the public vanity of our Boston cousins, but the hearty shouts of laughter which burst out at the close of the operation, in which the whole audience joined, proved that to nearly all it was an unexpected surprise, the humour of which struck everyone simultaneously."

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To Correspondents.

Y. S. R.—In reference to the photograph painted by Sant, to which we referred, at the South London Society, as having become spotted and spoiled through imperfection in the fixation or washing, we have no information as to whether it was painted in oil or water, but we have no doubt it was the former, as Sant always paints in oil, and, moreover, if we remember rightly, it was enlarged on canvass. We can only suppose that it must have been the result of some gross carelessness in the manipulative department, as by the known processes, with ordinary care, we believe pictures may be produced which, when painted in oil, and thus protected from atmospheric and other influences, will remain permanent. We can readily believe that you have photographs painted in oil nine years ago which have not faded or changed. We have specimens painted by ourselves five years ago, which are quite unchanged.

A Subscriber.—We cannot state with accuracy how long sensitive paper, prepared by the Wothlytype process, will keep good. We know that Colonel Stuart Wortley kept some ready for use, trying a sheet from time to time, for some months, without deterioration. The Association intended originally to send out the paper ready for use, but whether it is done at the present time we cannot say. Write to Mr. Brown, the secretary, 213, Regent Street, of whom you can obtain precise information.

An Anti-Ruskinite.—It is somewhat difficult to produce a good portrait in a room with only a side window 6 feet by 4; but it is nevertheless possible when the light is bright. Place the sitter with his side to the window, about 2 or 3 feet from it, not directly opposite, but about a foot behind it, so as to have an advanced side light. Parallel to the window, and a few feet from the sitter, place a white screen, the angle of which can be inclined a little to regulate the amount of reflected light on the shadowed side of the face. As a rule, the room on the third floor with the north light will be best. 2. We have found Newman's preparation the best size for albumenized paper, prior to employing water-colours on the print. Some colourists employ a dilute solution of gelatine with the colour, and find that this makes it take "kindly" to the albumenized surface. The chief objection to the use of a varnish for the purpose arises from the somewhat incongruous effect of varnish, intended for large pictures in oil, on small and delicate pictures, producing what some would consider a vulgar effect.

W. S.—The print you enclose is a satisfactory result from a tannin plate. You will find details of the simplest method of working the process in Mr. Hughes's paper read before the London Photographic Society, pp. 603 and 613, Photographic News, Vol. VIII., and in our last Year-Book. Also a brief but complete summary in Mr. W. W. King's remarks at the North London meeting, reported in our last.

W. H. James.—Nos. 191 and 264, the numbers in question, are in print. Our portable camera, described on p. 259 of our fifth volume, is made regularly by Mr. Meagher.

York.—The copyright in the case described is in the drawing, provided the proper steps were taken to secure it by registration. After copies of any photograph have been sold registration is of no use, as the copyright has been lost. Registration should be effected by the owner of the copyright before any copies are sold. The sale of a copyright negative is not necessarily a sale of the copyright, unless a proper assignment of the copyright is made, which assignment would require registration.

New Subscriber.—Your negatives are very far from sharp, the figures being either very imperfectly focussed, or the lens not working to focus, or the position of the dark slide not being coincident with that of the ground glass. The negatives are, moreover, fogged, possibly from a little white light in your dark room, and possibly also from the condition of the bath. In working a bromo-iodized collodion for card-portraits, you had better dispense with acetate of silver in your bath, as it is a frequent cause of fog and stains. The addition of a little nitric acid will probably improve your bath; and your negatives will be better for a little intensifying. It is probable that, with improved chemical conditions, your lighting will answer very well.

X. Y. Z. writes to complain of a titled amateur photographer selling his productions to the injury of professional photographers. So soon as any one commences the regular sale of his works as described, he in reality enters the professional ranks, and we see no reason why the gentleman in question should not do so if he choose. It is not in any case a matter upon which any one has a right to make public comment. There may be circumstances which render the acceptance of fair remuneration for honest work honourable and laudable, even in a baronet, rather than reprehensible.

J. W. J. S.—It is possible that the presence of a very small portion of chloride of gold in your collodion may not have spoiled it for working; but there is no way of mending the matter if it have. We will consider your suggestion.

Pyrogallic.—You will find the method of printing on opal glass with collodio-chloride of silver fully described in the Photographic News, April 28th and May 12th. 2. Your solution of tannin is evidently impure. You must filter out the the insoluble portion which causes turbidity before using it.

Received, and will be noticed in our next, Dr. Van Monckhoven's "Traité Général de Photographie," 5th edition.

Several Articles, "Critical Notices," and Communications are compelled to stand over for lack of space.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. E. Harrison, Newcastle, Staffordshire,
Two Portraits of W. Jackson, Esq., M.P.
Mr. J. Milton, Newcastle, Staffordshire,
Portrait of Rev. J. S. Broad.
Mr. J. Stuart, Glasgow,
Two Portraits of Bishop Gray.
Messrs. Minshull and Hughes, Chester,
Two Photographs of late Bishop of Chester.
Mr. R. Faulknor, Bayswater,
Two Portraits of Bishop of Oxford.
Mr. F. Downer, Watford,
Two Portraits of Hon. Francis Villiers.
Two Portraits of Lady Emily Villiers and Hon. F. Villiers.

THE PHOTOGRAPHIC NEWS.

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PHOTOGRAPHY WITHOUT A NITRATE BATH.

The desirable consummation, so long wished by photographers, so often sought by experimentalists, of dispensing with the nitrate bath, appears at length to have attained a practical issue. Mr. Sayce, in a communication which appears in another column, gives minute details of formulæ and manipulations, which he has been working out for some months past, by which it seems complete certainty and success are attained. The results obtained are not accidental successes which cannot be repeated; upwards of two hundred plates, it appears, have been tried, and the success has become certainty. It does not appear to depend either upon a number of doubtful conditions which can only be ascertained by experience, and which are so constantly varying that no definite instructions can be laid down. The details are as clearly and simply stated as the process is successful. Mr. Sayce has furnished us with examples of the results from time to time, which lack no quality of excellence in photographs. They are delicate, vigorous, clean, brilliant, and full of gradation, possessing, with no lack of force, more softness and detail than we see in nine-tenths of the dry-plate pictures brought under our attention. We remember that a favourite test with some old dry-plate experimentalists was the capacity of the process for rendering distance, which was, we take it, but another mode of regarding its power of registering delicate gradation. These pictures are admirable in this respect: with brilliant and vigorous foregrounds that have tender and atmospheric distances, aiding a very harmonious pictorial effect. If, as we see no reason to doubt, this process be found in the hands of photographers generally, as successful as it has been in the hands of Mr. Sayce, it appears to us that it must become *the* dry process *par excellence*, for general use, as no other can compare with it in simplicity.

As a wet process this appears to possess many advantages in simplicity of manipulation; and if means be found to increase its sensitiveness, it may go far to supersede the ordinary wet collodion process.

The great drawback to all the processes of this kind which have been tried hitherto has been uncertainty. Amongst the early experimentalists in this direction—M. Bellini, Captain Dixon, and others—the vaguest uncertainty as to formulæ and manipulations prevailed, and the few successes seemed to be accidents which could not be repeated. In our own experiments we employed a definite formula, but the exposure was long, and the results had a tendency to feebleness and fogginess, with insufficient promise of excellence to tempt us to further experiment. M. Gaudin has, we believe, experimented in the same direction, with what exact degree of success we are uncertain; but his process never came into practice. Mr. Nelson E. Cherrill has experimented with a similar process with more than the average degree of success; but his difficulty appears to have been uncertainty. It is somewhat singular in all the experiments in this direction that they appear to have originated independently with each experimentalist, without any knowledge of what had been done before. This is probably fortunate. Had Mr. Sayce been familiar with the fact that others had tried to dispense with a nitrate bath, and failed, he would possibly have felt less interest in the matter. The fact that it is with him an original idea permits him to make and traverse an original track, which has led to success. Mr. Cherrill, in his efforts, was not aware that Mr. Sayce had already attained success in the very direction in which his experiments were made, namely, the production of wet plates, as well as dry plates, giving good and certain results, by means of a preparation which contained all the sensitive materials in one solution, dispensing entirely with the employment of a bath of nitrate of silver. We shall be glad to hear of the success of any of our readers with Mr. Sayce's process.

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PHOTOGRAPHIC BACKGROUNDS AND ACCESSORIES.

We commend the attention of our readers to an intelligent communication on the art-phases of photography, by a correspondent signing "J. S. W.," from whom our readers have often received valuable information. On some points of the artistic copyright question and its foundation in equity, we had the misfortune to differ from him; but we were not the less interested in the valuable information he brought to bear on the argument. In his views on backgrounds and accessories we are entirely at one with him. For the most part scenic backgrounds have been an abomination in photographs, whilst they might be as effective in the photograph as they are in an engraving. We can remember but very few pictorial backgrounds in photographs which have even been tolerable. One or two of those of Mr. Robinson have been charming; but these he has had to paint or design for himself. One or two of those of M. Joubert, and also of M. Silvy, have been good. The backgrounds of the cards in the present Exhibition, by Mr. Faulkner, have more of the character of some of the fine engraving backgrounds to which our correspondent refers than almost any we have seen. Many of the ordinary pictorial backgrounds seem designed with an express view to destroy repose. Tessellated pavements sharply cut in black and white; columned corridors, with very strongly-marked perspective of their own, disdaining to have anything in common with the natural perspective of the subject; open windows; anything in short which admitted of hard cutting lines, which must destroy repose and breadth, and anything which could not possibly harmonise with a standing or sitting figure, has been industriously perpetuated; and some of the worst have been perpetrated by background painters of the most pretence.

The excess of unmeaning and florid ornament incongruously heaped together on accessories made of composition, is just as offensive to good taste, and should be avoided by all having any pretension to the character of artistic photographers. The desire to avoid the common-place in form and design has not unnaturally led many whose art education was defective, and whose taste was uncertain, to rush into the opposite extreme of uncommon and inartistic profusion in the use of incongruous decoration. The process of education will bring them back to the happy medium in which accessories subserve the general purposes of the picture, without asserting any claim to distinct regard or attention themselves. Our readers will look with interest for the further hints from our correspondent on the same subject.

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COLLODIO-CHLORIDE OF SILVER FOR DEVELOPMENT PRINTING.

We have been asked the question more than once as to the suitability of collodio-chloride of silver for development. One correspondent asks the question, as he is anxious to try it for enlarged negatives, to save the necessity of making a very large silver bath and procuring an enormously large vessel to hold it. Another asks because he wishes to try it for solar camera printing. Another because he wishes to use it for camera printing on curved surfaces. As we have not as yet tried it for development ourselves, we were unable to answer these questions satisfactorily, until our time permitted some experiments in that direction. Mr. Swan, of Newcastle-on-Tyne, has, however, anticipated us, and supplied us with valuable information and illustration of the possibilities of which the process is capable in printing by development. The print which is sent to us is both soft, vigorous, and good in colour; not quite so rich as a good print produced direct by the same process, but unlike the dead, sunken, grey-looking prints too common in ordinary development printing. We subjoin Mr. Swan's letter; but in doing so we must premise that we have not experienced the difficulty Mr. Swan describes in the shape of great loss of vigour and depth in toning and fixing. To what this, in Mr. Swan's hands, may have been due we cannot say, as we have not had opportunity of investigating the causes. Our prints always lost as much as albumenized prints in the course of toning and fixing, but very rarely more in either richness or depth. Mr. Swan's letter on development printing is as follows:—

My Dear Sir,—I have lately been trying development printing with collodio-chloride, and find that it answers well. The print I inclose had five minutes exposure in diffused light, and was afterwards developed in Carey Lea's bath of Gallic acid and acetate of lead, but used stronger than he recommends.

I was led to employ the development principle by a desire to obtain prints which would better resist the solvent action of the hyposulphite bath. I could easily obtain more than the required depth of colour in the print *before fixation*, but in passing through that ordeal the prints lost much of their brilliancy. Using the old mode of toning and fixing in one bath of mixed hyposulphite and gold avoided this evil, but, as I do not believe in the durability of prints so treated, I could not resort to this means of obtaining brilliancy. I therefore had recourse to development to obtain an image of a more substantial character.

You know my views on the merits of direct sun-printing, and that I regard it as superior to the development system in the rendering of detail and in the exact representation of the gradation of the light and shade of the negative; but, without at all abandoning this opinion, I yet see many advantages in the development system, and accordingly I am glad to find collodio-chloride so easily adaptable to it.

The fact is, each system has its merits, and under certain circumstances the one is best, and under different circumstances the other. To be able to obtain vigorous prints from weak negatives, to print rapidly, or with feeble light, and to have the print formed of a colouring matter, little alterable in the hyposulphite bath—these are among the advantages that I recognise in development printing.

The difficulty hitherto has been to obtain results at all comformable with the results of direct sun printing, and this difficulty I hope collodio-chloride will tend greatly to lessen.

What I have said is meant to apply more particularly to printing on paper; but in collodio-chloride printing on glass development will also be found extremely useful where a weak negative is to be dealt with, and difficulty is experienced in obtaining sufficient depth of colour in the shadows of the print. I have not found it necessary to add nitrate of silver to the developing bath; the film contains quite enough for ordinary prints.

The collodio-chloride I used contained citric acid.

I remain, dear sir, very truly yours,
Joseph W. Swan.

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EARTHENWARE AND OTHER VESSELS FOR PHOTOGRAPHY.

We have always especial pleasure in noting and commending commercial enterprise which tends to render the practice of our art more perfect and convenient. We have recently had our attention called to some examples of the photographic ware made by Messrs. Edwards and Son, of Dalehall Pottery, in Staffordshire, which appear to us to possess so many advantages in design and material over the old earthenware vessels of the earlier years of photography, that we feel we are doing a service to our readers in calling their attention to the subject. In years gone by many photographers contracted a very natural prejudice against earthenware for such purposes as holding the nitrate of silver solution, because, after a time, the glaze was apt to crack, the vessel began to leak, and the solution was, moreover, generally spoiled. Like many gutta-percha baths, those of earthenware stood perfectly for a time, but suddenly, when least expected, were found to be leaking, or, possibly, if they had been left a few weeks, they were found, as we have personally known, quite empty, covered with a hundred cracks which might be traced by the fine coating of metallic silver which had been reduced round each crack.

The vitreous ware of Messrs. Edwards and Son promises to remove the possibility of any result of this kind. We have just been examining some broken fragments of the ware, which appears as hard and fine as glass throughout, being, in fact, the material of which mortars are made. Some examples of similar ware which we saw some time ago lacked both form and finish; but the vessels we have examined appear in all respects most excellent. So far as we can judge, without the extended trial which time alone can give, these vessels will resist the action of all the solutions for which they may be required as well as glass, whilst they are much less fragile, and more economical.

The variety and ingenuity of the designs of the various vessels, both in the vitreous ware and in ordinary earthenware for vessels not required to bear the action of corrosive solutions, at once suggests that a photographer has been at work in the establishment, and that the attention to this department has been a labour of love as well as a matter of business. There is a neatness, lightness, and perfectness in the form of the ordinary dishes, &c., absent in much of the photographic earthenware we have seen, and a variety of designs we have not met with before. The stand for the nitrate of silver bath, which permits it to be surrounded by hot water in winter, or cold in summer, is one of the most important novelties. Most photographers are well aware of the loss of sensitiveness and other evils which arise from a very low temperature in the silver solution in winter; but it has not, we fancy, been sufficiently realized that evils quite as troublesome arise from the solution being kept at a very high temperature in the height of summer. Pinholes, as we pointed out last year, arise from the turbidity caused by iodide of silver precipitated when the solution becomes warm; stains, fog, &c., are common results. In the outer vessel, which serves as a stand for these baths, hot or cold water can be easily kept; for summer, pieces of ice, or water cooled by the application of some freezing mixture, may probably often be found useful, and save much waste of time and irritation.

We cannot enter into a detailed description of the various novelties in the shape of earthenware and vitreous ware vessels we find provided by Messrs. Edwards and Son. There is a capital self-acting washing-pan with an arrangement for attaching pipes, so that the vessel shall be emptied from the bottom with a syphon, which is of larger diameter than the supply-pipe; the vessel is provided with a drainer, or perforated false bottom, upon which the prints rest instead of lying at the bottom of the pan in the lowest stratum of water, which is of course most saturated with hyposulphite of soda. The aperture of the supply-pipe is intended to be placed in a slanting position, so as to give a rotatory movement to the prints. Nothing can be better for the washing of prints than this smooth, clean, earthenware vessel. We have before repeatedly recommended this system of washing prints. The syphon escape-pipe, being of a somewhat wide diameter, rapidly empties the pan of water, leaving the prints a few minutes' draining on the false bottom; the pan then fills again, keeping the prints in motion as it does so; when full, the syphon again comes into operation, and so a perpetual change of water is maintained, effecting a perfect washing.

There are, besides the vessels mentioned, some excellent well-baths for development; hot water dishes for toning and other purposes; albumen beaters; levelling stands with stone screws, &c., &c., all of exceedingly good construction. Those of our readers interested in electrical apparatus will find some very capital porous cells for every form of battery amongst the apparatus for that branch of science. Altogether, we have been much interested and pleased with an examination of the improvements in pottery ware for photographers which Messrs. Edwards and Son have courteously brought under our notice.

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Critical Notices.

THE PORCELAIN PICTURE: with Full Instructions How to Make it. By PROFESSOR TOWLER. (New York: J. H. Ladd; London: Trübner & Co., Paternoster Row.)

IN this timely *brochure* Professor Towler, whose name is well and favourably known to our readers, gives to photographers complete instructions for the production of photographs on opal glass and porcelain, by wet and dry processes, with detailed descriptions of the appliances necessary and the materials to be used, and adds hints on the methods of colouring which may be employed with advantage. As we have recently stated, we believe that the use of collodio-chloride of silver process is the best means of producing such pictures; but, although this process is not described here, much of the information relating to other processes will be found useful in applying ours. Again, wherever an enlarged or reduced copy of the negative is required, contact printing is not available, and camera printing must be employed, for which the fullest information will be found here. The book is clever, clear, and essentially practical, and we have pleasure in commending it to the attention of our readers. We extract from it, as a sample, the following useful chapter:—

MANIPULATIONS IN TAKING A PICTURE ON PORCELAIN BY THE WET PROCESS.

As soon as the camera is all in order, the next operation consists in taking a negative suitable for the purpose. This is no easy matter with your present conceptions about negatives, derived from your experience in room-work; as a certain thing, you will make your negative as dense as for the photograph of a card picture, and will thus have to unlearn much that you have already learned. Whether you copy from an engraving or from nature, one rule acquired from experience is this: expose long enough to get detail—in fine, expose a little too long; for without detail your picture may look clean, but it will not be artistic; it will be a mere black and white daub.

The developer must be one that works slowly but gradually, so that the high lights are kept back, or restrained, until the fine markings get a start. The following developer is found to be very efficacious in cases of this description:—

DEVELOPER.

Double sulphate of iron and ammonia	2 drs.
Protosulphate of iron	2 ,,
Water	8 ozs.
Acetic acid	2 ,,
Alcohol	6 drs.

If the picture flashes out too quickly, add more acetic acid, or diminish the time of exposure in another attempt. With this developer you can watch proceedings easily enough. As long as there is no appearance of fog, proceed until the proper intensity is obtained. *Above all things*, keep the picture bright and transparent. Finally, wash the negative well, and fix as usual with cyanide of potassium, or hyposulphite of soda.

The nitrate of silver bath we prepare in the following manner:—

Recrystallized nitrate of silver	4 ozs.
Distilled or rain water	48 ,,

After solution, the bath is tested with a piece of blue litmus paper to see whether it is acid or not; if it is, the litmus paper after a while becomes red when immersed in the fluid. In this case, we boil the whole solution in a large glass flask or retort, or in a porcelain dish placed in a sand bath with an addition of 10 grains of oxide of silver. This oxide is prepared as follows:—

Dissolve 1 drachm of potassa in 4 drachms of water, and then drop into the solution some of the silver solution as long as a brownish precipitate is formed. Let this substance settle, and then pour off the liquid above it. Add water to the sediment and shake the mixture well, and when the precipitate has again settled, pour off the water, and repeat the operation several times, until the water which has been used for washing the sediment no longer restores the blue colour to red litmus paper. The washed and moist oxide of silver is preserved for future use.

After the bath has been boiled about a quarter of an hour with the oxide its acidity will have been removed. We then divide the bath into two halves; and one of these we saturate by boiling with 5 grains of iodide of silver, which is prepared as follows:—

Take a drachm of iodide of potassium and dissolve it in 4 drachms of water; add to this solution some of the silver bath, drop by drop, as long as there is a yellow precipitate formed; let the precipitate settle, pour off the supernatant liquid, and wash the deposit several times in the same manner as the oxide was washed. Keep the iodide moist and ready for use when required.

After boiling one-half of the silver solution with iodide of silver, it is taken from the sand bath and filtered; the other half is added to the filtrate, and the whole is then filtered a second time through fresh filtering paper. This bath is very sensitive, because it is quite free from all extraneous matter; it will not be apt to produce pinholes in the negatives, because it is not saturated with iodide of silver; it may, however, have a tendency to produce fogginess, because it is very sensitive and quite neutral; this will especially be the case with a colourless or new collodion. Add, therefore, a drop or two of acetic acid until the trouble is overcome. The following collodions work well:—

No. I.

Ether	25 ozs.
Alcohol	25 ,,
Tincture of iodine	24 mins.
Iodide of cadmium	48 grs.
Bromide of cadmium	32 ,,
Iodide of ammonium	126 ,,
Bromide of potassium	44 ,,
Pyroxyline	7 ,, to

the ounce (more or less, according to its solubility, or the requirements of the case).

No. 2.

Alcohol	12 ozs.
Ether	10 ,,
Iodide of ammonium	110 grs.
Bromide of potassium	44 ,,
Pyroxyline	7 ,, to

the ounce, or more, etc.

The collodion for our present purpose must not be thick and glutinous, otherwise the film will be full of reticulations, which will be reproduced in copying. Some persons prefer an old collodion for the preparation of opal or porcelain pictures; for, by means of the free iodine in the collodion, they are enabled to produce clearer pictures. Such collodions, however, are less sensitive than freshly prepared specimens; and will not, therefore, produce the same amount of detail in the same time. We do not think we err by recommending a new collodion, and we pretend, by tincture of iodine in the collodion, or acetic acid in the silver bath, and an appropriate developer, to be enabled to obtain a better result than with an old collodion.

If, after fixing and washing, the negative is not quite free from fog, but yet there is an abundance of detail, the negative may perhaps bear clarifying, although we think it better to take a new negative.

The negative is clarified in the following manner:—

TO CLARIFY THE NEGATIVE.

Prepare tincture of iodine, by dissolving 4 grains of iodine in 4 drachms of alcohol. Pour 4 drops of this solution into 2 drachms of water, and then pour the mixture, after shaking, over the still wet negative; keep the mixture moving about a few seconds, and then pour it back into the vial and wash the film. Now pour over the film a dilute solution of cyanide of potassium, which will remove the fog and leave the picture clear. After this, the negative is washed, and intensified slightly, if required. But if the gradations of light and shade are good, and the intensity of the high lights by no means so great as in the negatives for paper prints, the results will be good in this sort of printing by means of the lens. In most instances no intensifying is required, if the development in the first instance is carefully managed. The reader will gain a better criterion of what amount of intensity is required by purchasing a transparent positive stereograph by some of the European artists, as, for instance, by England, Ferrier, Braun, etc. The exact same amount of intensity seen in the positive must exist in the negative. Let me here impress upon you distinctly the necessity of first getting a clear, sharp, bright negative, full of detail, and agreeable gradation of shade, before you make any attempts at preparing a porcelain picture.

Having succeeded with the negative, place it wrong side up in the plateholder, with the film toward the lens. The plateholder for this purpose requires neither slide nor shutter; the negative is kept in its place by means of small springs or pins in the corners. If the picture is to be square, oblong, oval, etc., a mat of the required shape is placed over the negative and in contact with it. If, however, the picture is to be represented in vignette, an oval or elliptical opening is made in a metal or wooden partition in the space, either in front of the lens or behind it, through which the rays from the negative have to pass. You will naturally understand that the negative in its present position must lie in a plane perpendicular to the base, every part of which is equally distant from the plane in which the lens is fixed, or in which the collodionized plate is held. If it deviates but the one-tenth part of an inch in any part, you cannot succeed in getting a good picture. See to this before you take a copy.

The exciting and exposing are then described:—

The picture is developed by means of the solution already given. Watch the development carefully, and stop before the least veil or fog supervenes; finally, wash the film and fix the picture. If the latter is full of detail, is sharp and bright, and in every sense of the word free from cloudiness or fogginess, you have so far succeeded.

The second step in the operation consists in toning the picture, if it is already intense enough; or in redevelopment or intensifying the picture, if the picture is not intense enough.

The picture, we will suppose, lacks in density, but the detail is complete. The transparent positive is still wet: flow over it a sufficient quantity of the mixture of water and tincture of iodine, such as was used in the clarifying process; move the solution backward and forward upon the plate until the film assumes a gray-rosy hue; then pour back into the vial the residue. If the positive requires but a small amount of intensifying, this deposit of iodine will not be necessary; and, as soon as the film is well washed, we should proceed at once to the next step.

Make the following solutions:—

Pyrogallic acid	12 grs.	Stock solution.
Acetic acid	1 oz.	

For present use take:

Of stock solution	1 dr.	Present use solution.
Water	7 drs.	

To intensify the picture take:—

Present use solution	4 drs.
Nitrate of silver solution 20 grs. to the oz. ...	10 drops

Pour this solution upon the wet film, and keep it in motion until the desired intensity is obtained.

TONING THE PICTURE.

The tone of the positive is not agreeable at this stage, that is, as a positive; our next and final step, therefore, is to change the hue and give it a rich black, or blue-black tone. This is effected in the following manner:—

TONING SOLUTION.

Terchloride of gold (neutral) ...	1 gr.	Stock solution.
Water	1 oz.	
Of stock solution	6 drops	Present use.
Water	4 drs.	

Cover the film with the latter solution, and keep it in motion until the desired tone has been attained. Finally, wash thoroughly, and dry the film. The picture-side of the plate is now varnished with a colourless flint varnish, such as is used for ambrotypes.

Porcelain pictures are mounted in various ways; some are placed in cases such as are used for ambrotypes or melainotypes, with this difference, that either the back of the case has an oval or vignette opening, or that the picture itself is so arranged as to be independent of the back or front lids. In the latter case a mat is placed on either side of the porcelain plate; and when the preserver is fixed, the picture moves on hinges, and acts like the leaf of a book. Much beauty is also communicated to the picture by fixing a coloured plate of glass behind it, and then the mats, etc.

A very common application of the porcelain picture is its substitution for the panes of glass in lantern or lamp shades.

The porcelain picture, mounted in elegant and light frames, is frequently seen taking the place of embossed porcelain containing scriptural pieces, and suspended in parlour or drawing-room windows. The effect is quite pleasing.

The porcelain portrait, in vignette style, can be coloured like any other photograph; but, when coloured artistically by stipling, etc., it surpasses in beauty and softness any other photographic production. It is in this department of portraiture that the artist-photographer can display the extent of his genius and acquirements to the best effect and with the richest remuneration; for the results are indescribably charming, and people of wealth and taste are willing to possess whatever flatters vanity, either by superiority of execution or expense of production.

TRAITÉ GÉNÉRAL DE PHOTOGRAPHIE. Cinquième édition. Refondue et comprenant un Chapitre Spécial sur les Agrandissements Photographiques, par D. V. Monckhoven. Avec figures dans le texte. Paris: Victor Masson et Fils.

We have before described Dr. Van Monckhoven's General Treatise on Photography as the most comprehensive and complete work on our art which we have met with. Every branch of the art is treated in the most practical as well as the most scientific manner, and there is scarcely a point on which the photographer can require information which is not treated in the amplest manner. One of the marvellous features of the book is its wealth of illustrations, nearly three hundred excellent wood engravings being found in its pages, aiding the reader materially in understanding not merely the forms of apparatus, but modes of manipulating. This edition, which is revised, increased, and re-written where necessary, contains minutely detailed information on enlargement, a subject of which Dr. Monckhoven has so especially mastered, as illustrated by the magnificent examples he has recently exhibited in this country, and for which he has obtained both the gold and silver medal in France.

PORTRAITS OF BRITISH AMERICANS. By W Notman; with Biographical Sketches edited by Fennings Taylor. Part I. Montreal.

It is generally admitted that good biographical literature unites in itself the most instructive and most attractive and entertaining characteristics. It is a somewhat singular fact that, this being the case, so many attempts made in this country, to publish serial biographies illustrated with photographic portraits have practically failed to secure anything like general success. It is possible that the failure is due to a variety of causes, prominent amongst which has probably been the fact that the biographies have been of too short and flimsy a nature, serving rather as a little descriptive letter-press to the portraits than as trustworthy and complete although epitomized biographies. The first part of the "Portraits of British Americans," now before us, bids fair to remedy that evil; the sketches are cleverly written, and are something more than mere outlines finished in one or two pages. The portraits are, like all the works of Mr. Notman, as perfect photographs as it is often our privilege to see. The portrait of the Lord Bishop of Montreal is a grand specimen of card portraiture, and others are scarcely inferior. If merit be the condition of success, this undertaking must succeed. We hope to be able to record its satisfactory progress in all respects,

PHOTOGRAPHY WITHOUT A NITRATE OF SILVER BATH.

Wet and Dry Negative Processes with Collodio-Bromide of Silver.

BY B. J. SAYCE.

In September, 1864, I published a process by which negatives could be obtained in a simple and certain manner, without the aid of a nitrate of silver bath. Since that date I have not in one single instance made use of the bath, and have experimented upon upwards of 200 plates with unvarying certainty and cleanliness, accompanied by a considerable saving of *labour, time,* and *expense* in the preparation of the negatives.

Although the formulæ first announced will be found to work as at the time it was made public, I have since adopted some slight modifications, and the following contains the mode of manipulation which I would recommend to those interested in the process :—

Preparation of the Collodion.

Take bromized collodion, containing 8 grains of bromide in each ounce; mine is prepared as follows, and is that which I have used for 2½ years with a 60-grain bath for rapid exposure :—

Bromide of Cadmium	6	grains
„ Ammonium	2	„
Soluble pyroxyline of fair, ordinary quality	6	„
Ether	½	ounce
Alcohol	½	„

Prepare as much as required, and, when mixed, allow to stand for a week, and then pass through a retort filter. The filtration is not absolutely necessary, but I find it a certain cure for the transparent spots respecting which so many complaints were made last summer.

When the above bromized collodion is ready for use, take crystallised nitrate of silver twelve grains, reduce it to a *fine* powder in a glass mortar, and then add one or two drops of water, or say sufficient to produce a kind of pulp; then, in a yellow or non-actinic light, mix the collodion with the silver, stirring with a glass rod or pestle, as the mixture is being poured into the bottle intended for its reception, then shake up well, and allow to stand.

In an hour it is ready for use, and should be decanted into another bottle for use in coating the plates. It has been suggested that the nitrate silver should be dissolved in alcohol, and then mixed with the collodion. This plan, doubtless, would work well, but I prefer to be satisfied that the bromised collodion is in perfect condition before adding the nitrate silver, for afterwards I do not believe it possible to remove any defect in the preparation.

Another mode of producing a collodion for use without a bath, is by forming bromide of silver by precipitation from aqueous solutions of bromide, potassium, and nitrate of silver, then washing the precipitate in alcohol until water is eradicated, and adding to plain collodion sufficient to produce a creamy film.

To render this method most successful it is desirable to add to the collodion a few drops of an alcoholic saturated solution of bromide of cadmium. I do *not* adopt this mode of preparing collodio-bromide of silver, but give the suggestion for the use of those who may make the experiment.

Having tried each way I prefer the original method, *i.e.*, that of adding nitrate of silver to bromised collodion in the proportion above-mentioned, and fortunately it boasts of a further advantage; viz., that of occupying less time in practice than in description.

Use of the Collodion in a Wet State.

Take a perfectly clean plate of glass free from scratches, tip the edges for an eighth of an inch with a solution of one grain of india rubber in one ounce of benzine, and then coat with the collodio-bromide of silver, allow to set the usual time, and then place in a dish of water until the greasy appearance has vanished.

If *warm water* can be obtained conveniently use it in preference, there being a great saving in time, and the plates are more sensitive.

When the water flows freely over the film, take the plate out of the dish, wipe the back, and drain for a moment upon a piece of blotting-paper, then place in the dark slide for exposure in the camera.

Expose a little longer than wet collodion with nitrate bath before development, wet the film with a little water, and pour over

Proto-sulphate of iron	25 grains
Glacial acetic acid	25 minims
Water	1 ounce,

To 3 drachms of which add 2 drops of solution of nitrate of silver, 20 grains to 1 ounce of distilled water.

The image appears quickly, and in every respect like an ordinary wet plate, and a few trials will show the proper exposure.

Intensification may be accomplished by any of the methods adapted to wet plates, and the fixing with cyanide of potassium, 20 grains to the ounce of water.

Use of the Collodio-Bromide of Silver in the preparation of Tannin Plates.

Coat a clean plate of glass previously nipped at both edges with india rubber in benzine, with collodio-bromide of silver, and when the film has set, place in a tank of water; then coat another plate, which also place in the tank until the number required is completed.

Then have ready a dish of water from the kettle, as hot as the hand can bear. Take the plates out of the tank in rotation, and place them into the hot water for about thirty seconds, and then into a bath of tannin solution, 15 grains to the ounce of water, well-filtered; or in the following solution, suggested to me by Mr. Verity of Manchester, which I find superior to the ordinary tannin solution, viz.:—

Tannin	10 grains
Gallic acid	5 „
Water	1 ounce
Grape sugar	5 grains
Alcohol	10 minims.

Prepare *quantum suff.* as follows :—Dissolve the tannin in a portion of the water, and filter; dissolve the gallic acid by heat in another portion, and when filtered, mix with the tannin, then add the grape sugar, and again filter; the alcohol may now be added, and it is ready for use.

If the plate is allowed to remain in the above solution three minutes, and is properly exposed, very little intensification is necessary.

When ready, take out the plate, and drain and dry evenly and quickly in any convenient and suitable manner. I have a drying-box, with hot water over the plates, standing in racks, and the whole closed up with a door.

Expose about one half the time required for tannin plates with bromo-iodized collodion.

Development. Prepare the following solutions—

No. 1.—Alcohol	½ ounce
Water	½ „
No. 2.—Carbonate of ammonia	40 grains
Water	20 ounces
No. 3.—Pyrogallic acid	96 grains
Alcohol	1 ounce
No. 4.—Bromide of potassium	10 grains
Water	1 ounce
No. 5.—Nitrate of silver	30 grains
Citric acid	15 „
Distilled Water	1 ounce.

Pour over the dry-plate once or twice sufficient of No. 1. to cover it, and then return to the bottle for use with the next plate.

Then place in a dish of water until the greasy appearance has vanished.

Then pour over evenly sufficient of No. 2, with a few drops of No. 3, and two drops of No. 4 added, and wave *to* and *fro* with a rocking motion.

The image should very soon appear, and may be developed until the *shadows* become *slightly* tinged, then wash surface and back of plate freely with water, and rinse surface and back with a little very dilute acetic acid (say two drops glacial acid to one ounce water), wash off the acid, and if any intensification is required, it may be effected by adding to (say two drachms water), three drops No. 3, and three drops No. 5 solutions.

When sufficiently dense wash and fix with cyanide of the same strength as for the wet plates, and wash thoroughly afterwards.

Strong cyanide solution answers better than weak. When the latter is used I have found a tendency of the films to split up on drying, which has not happened when strong cyanide has been used.

The above is an unreserved statement of the process by which I have worked, and is accompanied by prints from negatives produced by it, which probably the editor will criticise according to their merits; they are only the productions of a hurried trip in the Lake District, and from untouched negatives.

I shall be happy to furnish through you any further information that may be of assistance to those who give the process a trial. *Liverpool, June 23rd*, 1865.

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TO DUBLIN AND BACK, WITH A GLANCE AT THE EXHIBITION.

BY J. WERGE.*

Amongst the Irish professional photographers in landscape work, Mr. F. Mares, of Dublin, stands pre-eminent. His pictures of Killarney and views in the county of Wicklow are very beautiful, and give evidence of a cultivated eye and artistic taste in the selection of his subjects and points of view. There are other excellent views and architectural subjects by Irish photographers; but we are sorry to observe some that really ought not to have been admitted. They are not even average photography, being utterly destitute of manipulative skill, and as deficient in art-excellence as they can well be.

One branch of landscape, or, we should say, marine photography is without competition. We refer to those exquisite and charming transparencies by Mr. C. S. Breese. His moonlight effect is wonderfully managed; the water looks "alive," and the moonlight is dancing on the waves just as we have seen it far away upon the sea. His "Breaking Wave" is marvellous, coming to shore with its cavernous curl; we almost fancy we hear its angry howl as it dashes itself into foam on the beach. We have seen such a wave sweep the deck of a ship before now, and know well with what a ponderous weight and velocity it comes; and we wonder the more at Mr. Breese's success in catching the wave in such a position. We cannot, however, speak so highly of the "Sunlight" effects by the same artist. The transparencies as photographs are inimitable; but there is colour introduced into the skies which ought to have been taken up by the rocks, and so carried into the foregrounds of the pictures, to be natural. Such warm skies and middle distances and foregrounds are too antagonistic for the harmony of nature.

In portraiture, our Irish brethren of the camera contribute somewhat liberally. In that branch we noticed the works of Messrs Robertson and Co., S. Lawrence, and G. Schroeder, of Grafton-street, Millard and Robinson, Nelson and Marshall, and S. Chancellor, of Sackville-street, Dublin. T. Cranfield, Grafton-street, also exhibits some photographs beautifully coloured in oil.

The most eminent English photographers also show up well. We saw the well-known works of Mayall, Silvy, Claudet, Maull and Co., and others, eminent in plain photography. Messrs. Lock and Whitfield exhibit a Royal case of exquisitely-coloured photographs of the Prince and Princess of Wales and Prince Albert Victor. Mr G. Wharton Simpson also exhibits a few specimens of his beautiful collodio-chloride of silver printing process. There are some lovely specimens of that process with such a frightfully ugly name, but which, in plain parlance, are pictures on opal glass, though Mr. Helsby has christened them "Helioaristotypia miniatures." As a set-off to this, the next dry process that is discovered should be called "Hydrophobiatypia."

In amateur portraiture Mr. H. Cooper, Jun., exhibits a large number of his clever life studies, as well as those quiet and charming representations of his friends in their habits as they live.

Solar camera enlargements are very numerously contributed. Mr. Claudet sends some good pictures enlarged by solar camera and developed with gallic acid. Mr. Solomon also has some very good examples of enlarging. Dr. D. Van Monckhoven is an exhibitor of the capabilities of his direct printing camera. Mr. Mayall exhibits two series of very interesting enlargements by the Monckhoven camera, printed direct on albumenized paper; one is Tennyson, in eight different sizes from a one-ninth to a life-size head on a whole sheet of paper; of the other, Captain Grant, there are seven similar pictures. These photographs are all bold and vigorous and uniform in colour, and come nearer to our idea of what an enlargement should be than anything we have yet seen. Of the two, that of the Poet-Laureate is the best; the other is harsher, which is in all probability due to the difference in the subjects themselves. We can easily imagine that the face of Captain Grant, bronzed and weather-beaten as it must be, will present more obstacles to the obtaining of a soft negative than that of Tennyson. Specimens of photosculpture are also to be seen at the Dublin Exhibition, many of which are very pretty and life-like statuettes; but some of the figures seem much too large in the *busts*, and the plinths on which the figures of ladies stand are in very bad taste; being diminishing beads of a circular form, they suggest the idea of a huge crinoline just dropped.

Nearly all the denominations of photography have their representative forms and impressions in this Exhibition; and the history of the art, from the early days of the Daguerreotype to the latest vagary of the present day, may be traced in the collection of photographs spread before you on the walls and screens of the Dublin International Exhibition. There is the Daguerreotype, the Ambrotype, and the collodiotype, which ought to have been known as the Archertype; for the wet collodion process, although it is the most important of all the discoveries in photography that have been made since the first pictures were obtained in the camera by Wedgewood and Sir Humphrey Davy, is without a name conferring honour on the man who first applied collodion to photography. Archer's name is generally associated with it, but without taking that definitive and appellative form it ought to. We know that another claimant has been "cutting in" for the honour, but unless that claim can be "backed up" by data, we are not disposed to believe that it was anterior to 1851—the year of the first exhibition; at that date we know that Mr. Archer took photographs on collodionized glass plates. Then why should we not honour Archer as the French honoured Daguerre, and call the wet collodion process, the Archertype?

In printing and toning there are samples of nearly all the formulæ that have been discovered since the days of printing on plain salted paper and fixing in "hypo" only. There are prints on plain paper and on albumenized paper, toned and fixed in every conceivable way. There are prints on glass, porcelain, and ivory; prints in carbon, from the negative direct; and impressions in printer's ink from plates, blocks, and lithographic stones, which have had the subjects transferred to them by the aid of photography. There are Wothlytypes, and Simpsontypes, and Tooveytypes, and all the other types that have sprung from a desire to introduce novelties into the art.

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* Continued from p. 293.

In graphs and the various forms and fanciful applications of photography to portraiture, &c., there are stereographs and micrographs, and the old-fashioned "sit-on-a-chair" graphs, the "stand-not-at-ease" graphs, the "small carte" graph, the "large carte" graph, the "casket gem" graph, the "magnesium" graph, the "cameo" graph, the "double-stupid" graph, and the latest of all novelties, the "turn-me-round" graph. The latter is a great curiosity, and must have been suggested by a recollection of that "scientific toy" of ancient manufacture with which we used to awaken the wonder of our little brothers and sisters at Christmas parties when we were boys, by twirling before their astonished eyes a piece of cardboard with a bird painted on one side and a cage on the other, both pictures being seen at the same time during the rapid revolution of the card.

In apparatus there is not much to talk about; the Pantascopic Camera being the chief novelty. There are several of the manufacturers exhibiting in the photographic department, but we could not reconcile ourselves to the circumstance of Mr. Dallmeyer not exhibiting in the right place. His name is honoured by photographers, and he should have honoured Photography by going in under her colours. If he must go to the "scientific department," he ought to have gone there with his scientific instruments alone, and shown his photographic apparatus in the place assigned for that purpose. True, he makes a handsome show, but that does not atone for his mistake. Photographers are queer animals; jealous of their rights, and as sensitive to slight as their plates are to light; and we fear we are ourselves not much better. A large majority of photographers stand by Mr. Dallmeyer, and very justly believe in his 1 and 2 B's as shippers do in A 1's at Lloyd's; and *his* stand should have been in the photographic department.

In other parts of the Exhibition building there are various subjects highly interesting to photographers.

The chemical department has its attractions in samples of collodio-chloride of silver, prepared by Messrs. Mawson and Swan, for the opal printing process and the Simpsontype. Specimens of each type are also to be seen there; and there are other chemicals used in photography, even to dextrine and starch: the purity of the latter is known by the size and length of its crystals.

In metallurgy there is also something to interest photographers. Messrs. Johnson and Sons exhibit some very fine samples of nitrate of silver, double and treble crystalized, silver dippers, chloride of gold, nitrate of uranium, and other scarce metals.

Messrs. Johnson, Matthey, and Co. also exhibit some fine samples of nitrate of silver and chloride of gold; and some wonderful specimens of magnesium, in various forms, in wire and ribbon. One coil of ribbon is 4,800 feet long, and weighs 40 ounces; and there is an obelisk of magnesium about 20 inches high, and weighing 162 ounces.

There are many other things in this case of great value, which have a photographic bearing—amongst these a platinum boiler, valued at £1,500, for the concentration and rectification of sulphuric acid; a platinum alembic, value £350, for the separation and refining of gold and silver; also an ingot of platinum, weighing 3,200 ounces, and valued at £3,840. The exhibitors say that "such a mass of fused platinum is never likely to be again produced." The whole of the contents of Messrs. Johnson, Matthey, and Co.'s case of precious metals, most of which have a direct or indirect application to photography, are estimated at the enormous value of £16,000!

Mining, too, has its attractions for us; and as we near the Nova Scotia division of the Exhibition building the needle of our observation dips towards a bar of pure gold, weighing 48 pounds, and valued at £2,200 sterling.

By the gentlemanly courtesy of the Rev. Dr. Honeyman, Honorary Secretary and Commissioner in Dublin, from the province of Nova Scotia, we were favoured with a "lift" of this valuable lump of gold, and we could not help exclaiming, "What a lot of chloride this would make!" But we had to "drop it" very quickly, for the muscles of our fingers could not bear the strain of holding it more than a few seconds. This bar of gold was obtained from very rich quartz, specimens of which are to be seen near it; and Dr. Honeyman informed us that the average daily remuneration from such quartz was thirty shillings sterling per man.

It is not generally known that the province of Nova Scotia is so rich in gold; but, from statistics by the chief commissioner of mines for the province, we find that the average yield of the Nova Scotia quartz is over 19 dwt. per ton, and richer than the quartz of Australia; and the deeper the shafts are sunk the richer the quartz becomes. In 1864 the total yield from all the gold districts of Nova Scotia was 20,022 ounces 18 dwts. 13 grs. Gold dust and scales have also been found in the sands on the sea coast of the province, and in the sands of Sable Island, which is 80 miles distant, in the Atlantic Ocean. Having in our own colonies such an abundance of one of the precious metals so extensively used in the practice of our art, photographers need not be under any apprehension of having their supplies cut off.

(To be continued.)

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ART HINTS FOR PHOTOGRAPHERS.

The necessity and demand for information on art in relation to photography may be presumed to exist very extensively from the subject continually cropping up; and Mr. Wall's paper, recently read at the South London Photographic Society, has again directed attention to the question, how to render photography artistic. While it is admitted there is much truth in his remarks, they have also given rise to many censures on their sweeping denunciations; and in your criticisms thereon you admit that the subject being vague, it is of necessity treated indefinitely both by him and other writers. I cannot subscribe to Mr. Wall's dictum that the subject has been ignored, at any rate in your Journal. I have (with the exception of a few odd numbers only) the Photographic News for 1863, 1864, and the current year, yet I find within that period many valuable and interesting papers from Lieut.-Col. Stuart Wortley, Messrs. Rejlander, Wall, Jabez Hughes, V. Blanchard, H. P. Robinson, Cussans, MM. Disderi, Blanquart Evrard, Petsch, and Vogel, with many extracts from foreign journals, and the admirable article from *The Quarterly Review*; and while there are many who show in practice that they can satisfy in a great measure the requirements of art in photography, some also possess the ability and willingness to impart instruction to those requiring it, thus seemingly furnishing sufficient evidence to disprove that there is any apathy in "the photographic community" in regard to attaining artistic excellence in their branch of the arts.

But if we judge by the results, as we are bound to do, their application is still very limited in relation to the large body of photographers; and while there are many who have adopted photography who claim to be artists from a certain acquaintance with the brush and the palette, who nevertheless fail as much in the one as they never succeeded in producing anything worthy of note in the other, there are a still larger number who have taken to photography without any ideas or knowledge of art, who, while they desire and may improve slightly by practice, are ignorant of where to look for a good standard to work up to, and cannot profit as you would desire by the advice tendered, but are content to go on in "the old, old ruck."

But it occurs to me that there are a few matters which are sufficiently *definite*, and which I will attempt to point out. The public are now quite aware of the capabilities of photography in the way of lenses, and the power they possess of giving pretty correct definitions of objects; and, so far, photography *may* claim rank as "an exact science." Perfect manipulation, besides being necessary for the pleasing representation of figures and objects, and an important auxiliary towards good art, is also expected from those professing public photography, and so far technicalities must be studied and attended to, to enable the operator to produce negatives perfect in their mechanical character. But while the photographer is responsible to the public for the productions which he creates and issues to the world, he is at the mercy of those tradesmen who undertake to supply him with the accessories considered necessary to make up his picture, and if he does not possess taste and discrimination in the selection of such requirements he can never produce artistic work.

First, with regard to backgrounds, some consist of pretty littlenesses, nicely detailed; others, again, have their details, both distances and foregrounds, *so nicely* softened down that the whole scene looks as if it was in a Scotch mist; but you rarely meet with a background possessing that breadth necessary to compose well with the figure, but which, like the accompaniments to a good opera, constitute an enjoyment to the listener equal to that produced by the various melodies to which *they* form the backgrounds. I point out one instance, which just occurs to me, of a fine artistic background; it is one painted, I believe, by the late J. D. Harding, for Lake Price, and used in the carte de visite of Lord Elcho; it consists of a heather foreground, with low horizon, and masses of fine clouds, and was offered for sale, with some of Mr. Price's clearings from his studio, by Messrs. Puttick and Simpson last year. A similar cloud effect may be studied with advantage in an *early* impression of Landseer's "Stag at Bay," and an effect somewhat similar in character, viz., low horizon, and a sunset, may be seen in Lawrence's picture of the Duke of Wellington, engraved by S. Cousins, from the original in the possession of Sir Robert Peel: but plenty of good examples might be utilized from many of our portrait painters.

Now, I consider here is one definite point in which much improvement might be effected, but then you must operate upon the producers of such necessaries through the taste of the photographers; and, comparatively, how few possess that taste! It is a point in which our friends, the French photographic artists, much excel us, as may be evident from a study of their backgrounds, firm yet tender, giving sufficient balance to the figure, without being obtrusive, and showing a much higher appreciation of the beautiful than we find in the majority of our English productions. The next objectionable articles which you find so generally adopted are the pedestals, dadoes, and furniture, consisting of so many changes in one article. Now these last are certainly most ingenious, and may be useful in affording variety in a composition; but what I object to in them is, that they convey little idea of what they are intended to represent; for I am sure you must agree with me that you never yet saw a *real* Davenport made for the drawing-room so smothered in ornament as these abortions generally are. This curse of ornamentation also applies most offensively to the general tribe of pedestals, dadoes, &c., to which is added an utter disregard to the principles of construction in the lines and weight of moulding for top and base; and here I would direct attention to a letter from a correspondent, "F. T.," in No. 211 of the Photographic News, in which this particular part of a photographer's *properties* is exceedingly well handled, and will repay some thoughtful study.

But, again, you can find little evidence that this or other articles have had any influence on the production of these same accessories. In your advertising pages I find a book-case and a chimney-breast offered to photographers by two houses, in which there is much offence to taste; and, when pointed out, warn you as of those things that ought to be avoided. In the book-case (such as you would only find in the property-man's imagination), the lower panel shows *beyond the centre* to the upper half; and you have *more than half* the width of the glass given to the centre of the grate in the other. These may be small points, but, like straws thrown up, they indicate the way the wind blows, and to my mind they are errors which ought to be and might be easily corrected. Similar blunders are found in other quarters, and painfully suggest that the principles upon which such things are produced need reformation altogether. If you should attach any value to these "Jottings," I will endeavour to give you a further application of the ideas which occur to me, although I anticipate they will not be much relished in many quarters.

J. S. W.

ON THE APPLICATION OF PHOTOGRAPHY TO THE CONTINUOUS SELF-REGISTRATION OF MAGNETIC AND METEOROLOGICAL PHENOMENA, AS PRACTISED AT THE ROYAL OBSERVATORY AT GREENWICH.

BY THOMAS W. BURR, F.R.A.S., ETC.[*]

As the preparation of the sensitive paper will probably be the point of greatest interest to you, I give it in detail from a description by Mr. Glaisher himself. In the account of the process given by Mr. Main in his History of the Observatory, and in Mr. Brooke's paper, mention is made of the addition of four grains of isinglass to each ounce of the iodizing solution, but Mr. Glaisher's formula omits this. He gives the following explicit directions:—

The paper is made by Hollingsworth, and is a strong one, of even texture.

First Operation.—Preliminary preparation of the paper.

The chemical solutions used in this preparation are the following:—

1. Sixteen grains of iodide of potassium are dissolved in one ounce of distilled water.
2. Twenty-four grains of bromide of potassium are dissolved in one ounce of distilled water.
3. When the crystals are dissolved, the two solutions are mixed together, forming the iodizing solution. The mixture will keep any length of time.

Immediately before use, it is filtered through filtering paper.

A quantity of paper, sufficient for the consumption of several weeks, is treated in the following manner, sheet after sheet:—

The sheet of paper is placed on a board, covered with oil-cloth somewhat smaller on all sides than the paper, a condition necessary for preventing the iodizing solution from running under the edges of the paper. The paper is usually pinned on the left side of the board. A sufficient quantity (about 50 minims for a sheet of paper 15 inches long and 9½ inches broad) of the iodized solution is applied by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution.

The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer till used.

Second Operation.—Rendering the paper sensitive to the action of light.

A solution of nitrate of silver is prepared by dissolving 50 grains of crystallized nitrate of silver in one ounce of distilled water, adding in hot weather a few drops of acetic acid.

Then the following operation is performed in a room illuminated by yellow light:—

The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod as before) its surface is wetted by 50 minims of the solution. It is allowed to remain a short time in a horizontal position, and if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting paper.

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[*] Concluded from p. 297.

The paper, still damp, is immediately placed upon the interior glass cylinder, and is covered by the exterior glass cylinder, and is mounted upon the revolving apparatus to receive the slit of light formed by the mirror which is carried by the magnet.

Third Operation.—Development of the photographic trace.

When the paper is removed from the cylinder it is placed upon a board, and a saturated solution of gallic acid, to which a few drops of acetic nitrate of silver are added (in hot weather this solution is used at the temperature of the air, in cold weather it is heated to the temperature of 70 or 80 degrees), is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. When the trace is well developed the paper is placed in a vessel of water, and repeatedly washed with several successive supplies of water, a brush being passed lightly over both sides of the paper to remove any crystalline deposit.

Fourth Operation.—Fixing the photographic trace.

The photograph is placed in a solution of hyposulphite of soda, made by dissolving four or five ounces of the hyposulphite in a pint of water. It is plunged completely in the liquid, and allowed to remain from one to two hours, until the yellow tint of the iodide is removed. After this the sheet is washed repeatedly with water, allowed to remain 24 hours in water, and afterwards placed within the folds of linen cloths till nearly dry. Finally, it is placed between sheets of blotting-paper, and a heated iron passed over it.

The other descriptions give 8 and 12 grains of the iodide and bromide respectively to the ounce of water; but Mr. Glaisher's is the most recent and correct account of the process.

From the original records, after they have been fitted up with the necessary data of time scales, and value of base-line, negatives are prepared in the ordinary way of photographic printing, from which duplicates of the records can be obtained and distributed when necessary. The paper used is made by Rive, and the solutions are chloride of ammonium and ammonio-nitrate of silver. By the kindness of Mr. Airy I am enabled to show you one of these secondary photograms. I have described the apparatus and observatory as it existed some short time ago, but in the course of last year an alteration was made. In consequence of the difficulty of keeping the temperature nearly constant (and if this be not done the magnets are disturbed), an excavation was made below 3 arms of the observatory, and, being properly bricked round, the instruments have been placed in these vaults, and, as the temperature now rarely varies more than 10° from 60°, better results are obtained. The declination magnet below is a duplicate instrument, the original one being retained above for observing with the theodolite, which could not be moved, as star transits are required to be observed with it.

The saving of labour resulting from the introduction of the automatic registration of the instruments into the magnetic observatory is at least that of two assistants, while the work is better done and continuous instead of intermitting. Observations are kept up which, in the case of such capricious changes as those to which all the instruments I have mentioned are subject, is a matter of the gravest importance.

It only remains for me to observe that, although I simply undertook to describe the arrangements at Greenwich, with which I am familiar, it is perhaps right to notice that equally complete photographic registration of similar instruments is carried on at Kew, where also the electrometers are made self-recording, and that here, even before Mr. Brooke's invention of the Greenwich apparatus, Mr. Ronalds had succeeded in recording the electrometer traces on Daguerreotype plates; and that at Oxford the meteorological instruments are likewise made self-registering by nearly similar means.

I have also to mention that, upon the occasion of the annual visitation of the observatory last Saturday (June 3rd), I found an interesting addition to the photographic apparatus. In order to detect electrical currents in the earth, two wires are stretched, the one to Dartford and the other to Croydon, passing into the earth at both ends, and having galvanometers included in the circuits. Each magnet has a mirror mounted, by which a spot of light is reflected on to another photographic sheet, mounted on a cylinder made of ebonite, and the curves are thus registered as in the other cases. The apparatus has only been mounted about two months, and it is too soon to infer anything from the results; but it may be mentioned that the Dartford current is stronger than the Croydon; that both are stronger than was expected; and that the trace of the Dartford current occasionally bears a strong resemblance to that of the declination magnetometer.

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THE LONDON PHOTOGRAPHIC EXHIBITION.*

It may well appear not a little surprising that, after struggling on for ten years, the annual Photographic Exhibition can no longer maintain an independent existence; and that, after removing from place to place almost every year seeking a new home, it now appears as a modest adjunct to the Architectural Exhibition in Conduit Street. When we think of the enormous extension, both of the practice of, and demand for, photography; when we recollect the varied applications of the art, and that it is now cultivated by high and low, at home and abroad; by an army of amateurs, as well as by professionals; by ladies and men of rank, as well as by the intelligent mechanics who contribute to industrial exhibitions; that it has a literature of its own and supports several journals; and that there is hardly a home in the three kingdoms without a sun-picture of some sort; it does, we say, appear remarkable that a self-supporting exhibition cannot be established. Yet for some years, we believe, the receipts from the exhibition have not equalled the expenses; and the last and present exhibitions especially have been very inadequately representative of the progress of the art in various directions. Doubtless some blame must be attached to the management of these untoward results. The repeated alterations of the place and season of exhibition have alone been sufficient cause for numbers of the general public overlooking the show altogether. But the body of photographers must also be charged with unaccountable and, we suspect, illiberal neglect of a great means of advancing their art, and securing it a definite and respectable status.

A new complaint to be made this year is the absence of a catalogue. It is true that the title, method, and name of executant are affixed to each contribution. But, though this innovation is so far entirely commendable, it does not supersede the uses of a catalogue to those who wish to make comparisons and preserve a record. A more serious deficiency, however, is, as we have already intimated, the absence of examples of some new processes, of several valuable applications of the art, and of some of its most skilful practitioners. The only specimen of the too-much-vaunted Wothleytype is completely, and we need not add tastelessly, obscured by colour. There are no specimens of the photozincography and photolithography employed by Colonel Sir Henry James, in conjunction with the methods of chromo-carbon printing developed by Captain Scott, for the multiplication of copies of the "Ordnance Survey," "Domesday Book," &c. Some other processes of heliography, affording means for using printers' ink and carbon printing, are likewise not represented. In this exhibition surely there should also be specimens of the admirable photography from the Farnley Hall Turners, by Messrs. Caldesi, and other recent photographs after the same master; together with sheets of the photographic facsimiles of Shakspeare's first folios. Photosculpture, "crystal cubes," and other useful and ornamental applications of photography would also contribute to give the display a more popular character. As regards photosculpture, however, we may repeat what we said on its first appearance—namely, that it is not likely to win any but most qualified admiration from persons with a just conception of the nature of sculpture as a fine art. Moreover, until photosculptures are produced in London, as at Paris, by the aid of a large number of simultaneous photographs from different points of view, and not merely from a half dozen of such photographs, we shall not be disposed to accord to the invention even the moderate amount of credit it may fairly claim when properly carried out. It is utterly impossible for a photosculpture from a small number of views of a figure or object to have the actual or closely-approximate photographic accuracy claimed for the invention, whatever the degree of resemblance it may (but is not likely to) derive from the generally inferior sculptors employed to round off the ridges left after using the pantograph. The peculiar value of photography in copying architecture and sculpture should be more fully illustrated in such fine studies as those of the Architectural Photographic Society (though even these are surpassed by the French), and in such examples as have been on former occasions contributed by the Stereoscopic Company and by Messrs. Thurston Thompson, Lake Price, Dixon Piper, and others. We miss, too, from this exhibition, the exquisite "studies" of the Viscountess Hawarden, the artistic "out-of-focus" portraits of painters by Mr. Winfield, the beautiful vignettes of Mr. T. R. Williams, and the productions of some proficients in the management of figure-subjects.

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* From the *Illustrated London News*. This is the only extended notice of the Exhibition which we have seen in either the daily or weekly press.—Ed.

However, notwithstanding these drawbacks—notwithstanding that the exhibition is far from being so comprehensive as we think the Society ought to strive to make it, yet it is very interesting and in many ways instructive. The great discovery of the year is Mr. Wharton Simpson's new method of printing with the collodio-chloride of silver, and it is here exemplified (we wish it had been more fully) in three or four diverse tones of colour, one lane scene in a bistre tone being marvellously delicate and aerial. The process is as simple as it is beautiful; and, to Mr. Simpson's great honour, it is presented to photographers at large as common property unfettered by restrictions of any kind. The principle of the process is founded on the possibility of suspending chloride of silver in collodion in such a fine state of subdivision as to constitute something very nearly resembling a solution—a chemical fact so unexpected as to excite the surprise of every member of the Photographic Society present on its announcement.

The nearest approach to art, or rather the most bold and successful application of the principles of fine-art to photography, will be found in several portraits of literary men and painters, and studies from women and children, intended as illustrations of "Faith," "Hope," Charity," &c., by Miss Julia Cameron. These photographs are "out of focus;" but, for the most part, not extravagantly so, like some former works by this lady. We are disposed to think that some of their softness of outline, breadth, and (as we might almost say) their apparent lifelike capability of movement is obtained—so general and equalized are these qualities—by some mechanical contrivance other than by simple manipulation with the lenses. At all events, these attempts by scientific means to imitate nature not only as she is, but as we see her, afford rare pleasure to artists, and irrefragably establish any leading principles of art which have been ignored even by a certain class of painters themselves. How it is that these principles have not been more generally adopted by portrait photographers we are at a loss to understand. How it is, above all, that greater attention is not paid to lighting, we cannot conceive. Light, instead of being the greatest friend, is, we verily believe, the greatest enemy to the mass of photographers; and until we see three-fourths of their glass houses bricked up they will never be able to secure the one great charm of art within their reach, the broad, simple, and regulated chiaroscuro of Rembrandt, Correggio, and Velasquez. These productions by Miss Cameron, a portrait composition by Mr. Twyman, with two or three portraits by Mr. H. P. Robinson, one or two by Claudet, a few vignettes, and a solar camera enlargement of the head of Tennyson by Mr. Mayall, are among the few figure-subjects here which have any very decided art-value in ther lighting; and the remark can apply in very limited degree to vignettes. The portrait composition by Mr. Twyman, just mentioned, represents a musical club, "Our Society," as it is called. The various members are well arranged; but what is moreremarkable is the very diverse gradations of tone and degrees of definiteness with which they appear, according to their relative position—variations that are excellent in intention, though carried somewhat too far. But this, like all photographs produced from "positives" joined together from several "negatives," is open to the charge of violating our faith in the understood, or what should be the understood, conditions of photographic representation. The same objection applies in a more limited degree to Mr. Robinson's "picture compositions," of which the most noteworthy is "The Lady of Shalott." After making this deduction we must, however, admit that Mr. Robinson's contributions are, as usual preeminent for artistic feeling in idea, arrangement, breadth, selection of models, and accessories, combined with manipulative skill. But the most curious examples from more than one negative, and the most successful in their concealment of all traces of joining, are the "doubles" or "Siamese" photographs of Mr. Gill, in which we see a man shaking hands with himself, or drinking to himself, or squaring up to himself, a little girl wheeling herself along in a perambulator, and such like supernatural phenomena. The more ordinary "ghost trick" in photography, of which there are examples here, was noticed on a former occasion. Several beautiful subjects have been obtained by Mr. Rouch from the statuary and flowers in a handsome conservatory. Much taste is displayed by Mr. S. Thompson in his vignette "book illustrations."

We have given warm commendation to some photographs of the face and figure that appear to us to indicate artistic knowledge or feeling, because, without a certain amount of artistic treatment, photographs, more especially of the face, are, from various imperfections of the process, false to our impressions and destructive of the beauty of nature. But it is not to be concealed that there are many classes of subject in which any such treatment, or anything short of the utmost sharpness and accuracy of which photography is susceptible, would be wholly out of place. It must also be admitted that photography is never more legitimately employed than as a scientific record, wholly independent of art. Its value when so employed is indicated, for instance, in the photographs, by Mr. How, of numerous microscopic organisms and structures. It will be readily understood that applications of photographs such as this must be an immense assistance to chemistry, medicine, geology, and many branches of scientific inquiry. The photographs also by Mr. Bedford of buildings, sites, and scenes in the East are unsurpassed for delicacy and multiplicity of details, and have therefore the quality which, in photographic representations of such subjects, is of primary importance. On the other hand, Mr. Walker's photographs of more familiar scenes are also to be highly esteemed, because, while they have less detail where detail is of less interest, they are equally records of natural effect, although they render paramount those broad gradations which it is the aim of the artist to secure. The contributions of the two last-named exhibitors are instructively placed side by side, and evince how entirely distinct may be the works of two photographers—distinct, almost, as their several handwritings, or as the styles of different artists. Mr. Mudd, the results of whose manipulations lie, for the most part, between these two last, is represented in several admirable examples. The highest praise is also due to the Indian photographs of Messrs. Macfarlane and Buxton, their purity and beauty being the more remarkable on account of the greater difficulties imposed on the photographer by the climate. Some instantaneous stereographs, by Mr. Blanchard, of seaside views, with clouds and breaking waves; and a series of photographs of the animals in the Zoological Society's Gardens, by Messrs. Melhuish and Hayes, exemplify two of the many useful applications of the more rapid processes.

The carbon process of Mr. Swan we should have mentioned before as a novelty promising most valuable results. It may be remembered that we last year spoke in high terms of this process of printing (in which indestructible carbon takes the place of always more or less fugitive silver); but we spoke with some reservation, because the process was only illustrated in landscapes, not in portraiture. This year, however, there is a portrait, and we must say that it is the best example of the employment of carbon we have seen. Though unnecessarily black, and still lacking the extreme delicacy of a silver print, we have never yet seen the gradations and modelling of flesh so tenderly rendered by the material. Mr. Pouncy, who claims to be the originator of carbon printing, exhibits some examples; but, as these are prepared for enamelling, they are not fair specimens of his method. By-the-way, there are some beautiful monochrome and also several coloured photographic enamels. Lastly, Mr. Burgess exhibits specimens of ordinary printing on a material he calls "eburneum," resembling in its soft tone and semi-transparent texture the finest ivory. The material is, we believe, gelatine, opalised, in a state of fusion, with white lead.

Correspondence.

ANILINE COLOURS FOR PHOTOGRAPHS.

Sir,—I beg to thank both your correspondents of last week's News for their readiness in communicating their experiences regarding the permanency of aniline colours, and whose experiences differ so widely in their results that I am at a greater loss than before with respect to the propriety of continuing or discontinuing their use. Probably many of your readers may deem the present discussion about so trifling a matter as tinting to be quite unnecessary, seeing that it occupies valuable space in your most useful periodical which might be filled with more useful information; but to amateurs, having the phrenological organs of colour largely developed, it is an indescribable pleasure to be enabled expeditiously to add this only remaining desideratum to the otherwise (may I say) perfect photograph.

I would now still further trespass on your kindness by requesting the opinions of others of your numerous readers regarding this knotty and still undecided point, who may have had lengthened opportunities of judging of the merits or demerits of the disputed question of aniline colouring. Should it, by the majority, be indisputably decided that no confidence can be placed in the use of these beautiful and easily applied tints, I would then desire to be informed, through the medium of the News, whether there are not substances used in dying or otherwise that would give out their colours to alcohol, and which would be permanent when used as tints without the previous application of mordants. The use of a mordant I understand to be that of fixing the colour so as to enable the dyed material to withstand the test of washing, and not that of preventing its fading—a quality not needed in the tinted photograph. By experience I have learnt that colours dissolved in alcohol are immediately absorbed by the albumenized surface, and consequently have been in my tinting operations efficient substitutes for aniline colours, when the desired tint of the latter chemical has been wanting. The only objection I have found to the use of those I have as yet tried is that much to be regretted one of their reputed want of permanency. The three primary colours of blue, red, and yellow, if pure and strongly marked, would be almost sufficient for the photographer's purpose, as the intermediate tints might be easily obtained by judicious combination.

Would your correspondent, Mr. Callaway, of Bristol, kindly inform me what aniline colours he has been in the habit of using? From the unhesitating manner of his speaking of "the perishable" nature of his aniline coloured proofs, I cannot but place great confidence in his statements, and would almost indulge a hope that he has not been in the habit of working with the tints of Mr. Bailey, of Wolverhampton, which, in my hands, have produced so much more satisfactory results. Dr. Jacobsen's tints have not as yet been sufficiently long in general use, at least in England, to enable those who have tried them to speak confidently of their superior qualities or otherwise. Mr. Callaway must recollect that the colours of the two last-named chemists were made expressly with a view to their being used on albumenized photographs, therefore it would not be quite fair to condemn the practice of aniline tinting if the fading proofs had not been coloured with specially prepared tints.

I need scarcely add that my perseverance in endeavouring to get the above subject freely and fairly discussed can arise from no other motive than that of a desire to get at the truth, which can certainly be gained by the accumulated observations of many in a much shorter space of time than by that of a single individual.—I am, sir, yours very sincerely, Henry H. Hele.

Teignmouth, June 26th, 1865.

[Any discussion of interest to many of our readers has a legitimate claim on our columns, and we do not think our space wasted in a full examination of this subject.—Ed.]

PHOTO-BINOGRAPHY.

Sir,—In reference to the paper read by Mr. Pettitt at the last meeting of the Photographic Society, I beg to remark that I perfectly agree with Mr. Hughes that no stereoscopic effect can ever be produced by a single picture; for one picture only can give but the same identical image in each eye, similar to surface only; but in nature the images of solidity are always different. The right eye sees more of the right side and less of the left than the left eye does; and the latter sees more of left and less of the right than the right eye does; hence such difference becomes associated with solidity. The eyes are not to be tricked by a single picture. The effect of light and shade and perspective are different; the one cannot be substituted for the other. No picture, whether painting or photograph, truly represents nature; nothing but the stereoscopic pair can, for in them the conditions are fulfilled of seeing round the corners.—Yours truly, T. S. Reeves.

Plymouth.

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Photographic Notes and Queries.

Pantascopic Camera.

Sir,—Although, as will now be pretty generally admitted, the productions of the pantascopic camera, when viewed upon the flat surface, are distortions of the truth, still, when the object of the photographer is to obtain an artistic production of large angle, without caring about the truthfulness of the result, the pantascopic camera is undoubtedly a very valuable instrument; but the price at which it is now offered for sale is such as to render it a luxury in which every photographer cannot indulge. Considering the "quality and the quantity" of the work in the instrument, the price is, no doubt, quite reasonable, but, nevertheless, beyond what many desiring to possess it could well afford to pay.

I have often thought a cheap and effective panoramic camera might be made by using a rotating or other lens, and receiving the picture upon talc or mica plates, instead of glass ones, which, from their flexible nature, would admit of all the manipulatory advantages of flat plates, whilst they would do away with the necessity for the complicated and expensive appliances used to produce their requisite movement.

The negatives on mica could easily be printed from in the old-fashioned plate frame, and from their thinness and small weight would present many advantages over glass, both for stowage and transportation.

So far as I am aware, there is no patent (except it be that of Mr. Sutton) which could fetter the manufacture or raise the price of the mica-plate camera.

I make no pretensions to ingenuity in the invention of this instrument; indeed it is so simple that I have no doubt many have invented it before me; but perhaps they, like myself, have imagined there were difficulties to prevent its use, when experiment proves there are none.

However, the idea is entirely original with myself, and any value which it may possess I should feel pleasure in placing at the disposal of any who care to have it.—I am, sir, yours,

June 23, 1865. X.Z.C.H.K.F.F.

[The first panoramic camera invented, that of M. Martens, was on a similar principle to that indicated by our correspondent. We fear that it would be found difficult to get plates of mica sufficiently perfect and sufficiently large.—Ed.]

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Talk in the Studio.

Turner Reproductions.—The *Illustrated London News* says, speaking of the very fine series of more than thirty photographs by Mr. Thurston Thompson, from the Turner pictures in the National Gallery, published by Marion and Co.:—"Some of them are wonderfully successful in giving not only the broad masses of light and shade of the originals, but also much of the tenderness and atmosphere for which so many of Turner's works are remarkable. The series includes some of the most masterly productions of the great painter, ranging from 1803 to 1846. As studies for the artist they are invaluable, and as choice examples of art they must be equally acceptable to the general public."

Enterprize in Portraiture. — The *Athenæum* says: "London topographers of the future may thank us for the information that, at certain 'photographic establishments' not a hundred miles from Chelsea, the appetites as well as the vanity of the public are stimulated by the offer of an 'eel-pie and your likeness for sixpence.' In these cases, the combined charms of the offer are employed in aid of two apparently irreconcileable branches of science; but, in another case, which is really like a gastromantic incantation, as practised of old, the added temptation to 'your likeness' is a cup of coffee. So keen-edged is modern competition, that two men who had united their respective crafts, in photography and tobacco-selling, quarrelled; one of them, the 'professor,' immediately opened a tobacco-shop next door to his quondam partner, and completely cut him out by the offer of 'your likeness and a cigar for sixpence.'

New Source of Iodine.—Seaweed has heretofore constituted the sole commercial source of iodine, an article which is extensively used not only in medicine but in the arts. There is said, however, to have been lately discovered in Chili a mineral consisting of a mixture of iodine of lead with the oxide and chloride of that metal in such proportion as to contain ten per cent. of iodine. This mineral is believed to exist in considerable abundance, and if it really does so, a great reduction in the commercial price of iodine must be a speedy result of its discovery. Such a result would be a great boon to the art of photography, and also to that of dyeing, since the brilliant dye recently discovered by Dr. Hoffman, though the first, will not be the last, having this element among its constituents.

South London Out-door Excursions.—We may remind our readers that the first out-door meeting of the South London Society for this season will take place on Saturday, the members meeting at the Beckenham Station about 2 p.m., and at the house of the President in the evening at 7, where they are kindly invited to take refreshment.

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To Correspondents.

Enquirer.—An acetate toning bath should be neutral; nevertheless, an old acetate toning bath in good working condition may contain a little free acetic acid, which has been liberated as the soda with which it was combined has become united with the stronger hydrochloric acid present in a free state in the chloride of gold. 2. The terms negative and positive as applied to *Saxe* and *Rive* papers in the present day have but little meaning. In the days when calotype and wax-paper processes were commonly practised, a thin, fine, homogeneous paper was called "negative paper," and the stouter and coarser samples "positive paper." The terms indicate the same distinction in quality still, although the use for negative purposes has been discontinued. 3. Marine glue is used by the aid of heat. Make each of the pieces to be joined hot before a hot fire; then take a spirit-lamp and melt a piece of the marine glue as you would sealing-wax, apply to the broken edges and press them together. If well done, the joint will be as firm as the other portion of the vessel. Hot water would soften it again, but not luke-warm water.

T. J. Davis.—You will find the best information we can give you on glass houses in the Almanac, which you have just received. We cannot possibly undertake the best wholesale house for photographic chemicals.

N.—We have very rarely been troubled with the splitting of films; nevertheless, we think it is very probable that where such a tendency exists, irregular drying would increase that tendency, and your experiment seems to entirely confirm this view. We do not think that the application of a brisk heat in drying would cause any cloudiness. We have in various experiments applied very strong heat to collodion films, both by means of a bright fire, a hot oven, and by the flame of a spirit-lamp, and never found any evil result arise from it. A drying-box of iron would be better for having grooves, or whatever the plate may rest upon, made of wood, or some slow conductor of heat, otherwise the parts in contact would become unequally heated. We shall be glad if some of our correspondents will state their experience in reference to the splitting of films on large plates during drying.

E. Hayles.—The print is not a good or brilliant one, and it is probable that a better might be obtained from the same negative; but the negative lacks intensity and contrast, and would never yield a first-rate print probably.

J. H.—We never met with such a case as that you describe, and cannot therefore account for it, unless on the supposition that some mistake has been made; that it was not pure nitric acid, or not nitric acid at all, that you added to the bath. We have used nitric acid in our negative bath for years, and have known scores of others who have done the same, and never knew a single case in which its presence caused pin-holes. Perhaps, with the bath as it now stands, you cannot do better than try the empirical remedy of adding a little cyanide, sunning, and adding a very infinitesimal dose of a fresh sample of nitric acid, and then try again. The spots, &c., on the "Sleeping Girl" are the unmistakable results of excess of acetate of silver. We shall be glad to hear of the further result.

John Beattie.—There is evidently a mistake somewhere. Possibly it may have been a misunderstanding of the statement on our part. We will make further enquiry. We know nothing of the matter, except from the statement made to us.

W. B. N. & Co. (Portsmouth.)—The primary error in your operations appears to be the use of an unsuitable sample of paper, one which is too thin, soft, and absorbent. You require either a stouter and harder surface paper, or the addition of something to give vigour and keep the image on the surface. Some operators add a little gelatine or Iceland moss to the salting solution; Mr. Sutton adds a little lemon-juice to the silver solution for this purpose. The formula given by Mr. Woodbury, in our last Year-Book, has given some of the best developed prints we have seen. The prints by Dr. Van Monckhoven's new method of development printing are very rich and vigorous. The print sent to us by Mr. Swan, and described in his letter in another page, produced by development with the collodio-chloride of silver, is very vigorous. The price of volumes of the Photographic News is 15s. each. Those for 1863 and 1864 are in print.

A. Gaay.—The chief cause of your failure is the use of an unsuitable sample of collodion. There is not enough body to begin with; with such a sample of pyroxyline as that you have employed nearly double the quantity is necessary to give sufficient body. With this addition of pyroxyline and a little more free nitrate of silver you would get much more vigour. But so far as we can judge, even then the prints would not be brilliant, as, unless we are much mistaken, the pyroxyline is of that kind which gives an opalescent or opaque film. Try a little without any silver in it on a plate of glass, and see if it dry quite glassy and transparent; unless it do so you cannot get good prints, as the blacks are enveloped in an opalescent film. The prints you enclose are not half printed; the deepest blacks are a drab or gray, and there are large masses of white without any detail. It is quite hopeless to expect that any toning process will yield black tones from such prints. We obtained on the pieces of sensitive paper very much better prints than yours; but from the cause first mentioned they were not quite good. On coating a piece of the paper over half of its surface with a good sample of collodio-chloride, and then exposing the whole under a negative, that part which was recoated was over-printed and bronzed, giving great vigour in the same time, which the other portion, coated by your sample of collodio-chloride, only printed to a feeble drab tint. 2. You may use Mr. Heisch's formula for iodizing rapid collodion with advantage.

One who Studies the News.—We cannot give you a better formula for collodion than that published in our Year-Book. You may make up the iodizing solution separately by dissolving the iodides and bromide named in one-half of the amount of alcohol to be employed. Thus, for 4 ounces of collodion dissolve about 20 grains of pyroxyline in 2 ounces of ether and 1 ounce of alcohol, and then add 1 ounce of alcohol containing 10 grains of iodide of ammonium, 8 grains of iodide of cadmium, and 3 grains of bromide of cadmium. It is a peculiarity of collodion made with methylated spirit, and especially if it contain cadmium salts, that it becomes colourless with keeping. The only plan is to add a little tincture of iodine when it may require it. 2. If your acetate toning bath precipitate in the dark when only kept a few days, it is probable that the acetate of soda is impure and alkaline. The addition of a very slight trace of chloride of lime will in all probability prevent the precipitation. Application for space in the forthcoming North London Exhibition should be made to Mr. Barnett, 12, Ockenden Road, London, N. The prints by Mr. Robinson, which you name, can be procured on direct application to him at Winwood House, 68, Canonbury Park South, London, N.

Amateur.—The information given to you to the effect that the unaltered iodide in negatives produced with the collodion, of which you forwarded a sample, would not dissolve on application of the hypo or cyanide fixing solution, was a foolish error. We found no difficulty in so dissolving it; the person who came to that conclusion had probably used a very weak solution and had not had patience. The collodion was, however, too thick, over-iodized, and of too horny or contractile pyroxyline, and being colourless was inclined to fog. We added sufficient tincture of iodine to make it the colour of brown sherry, and one-fourth of its bulk of alcohol; it then gave a good negative; but the film was still horny and coarse. Time possibly may alter its physical qualities, but it will probably always be imperfect in this respect. A solution of gutta-percha, or a strong shellac varnish will answer.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Registrations.—All Photographs sent to this Office for Registration are immediately attended to, and parties interested may venture to act upon this assurance. Our Publisher will endeavour to acknowledge the same in the News every week, and so avoid the correspondence occasioned by delay. This must be a sufficient answer to several letters now on hand.

Mr. R. Davies, Newcastle-on-Tyne,
  Photograph of Drawing of Old Houses, Pilgrim Street, Newcastle.
Mr. John Beattie, Clifton, Bristol,
  Five Portraits of Mr. Freemantle.
Mr. T. Wilkinson, Dover,
  Portrait of Lord Bury, M.P.
  Portrait of Eustace Smith, Esq.
Mr. E. Reeves, Lewes, Sussex,
  Photograph of Stanmer Lodges.
Mr. R. Glass, Cobridge, Stafford,
  Group of Bust Portraits. (Officers of Manchester Odd-Fellows, &c.)
Mr. John Stark, Etruria Vale, Stafford,
  Photograph of Bust of Richard Cobden.
Mr. C. R. Loaa, Wadebridge, Cornwall,
  Three Photographs of "Longship's Lighthouse."
Mr. E. Harrison, Newcastle, Staffordshire,
  Two Portraits of E. Buckley, Esq.
Mr. H. McFarlane, Buchanan Street, Glasgow,
  Fourteen Views in Glasgow.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 357.—July 7, 1865.

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THE NORTH LONDON PHOTOGRAPHIC EXHIBITION.

We have reason to believe, if the contributions equal the promise, that the Photographic Exhibition to be held in the Agricultural Hall in August next, in connection with a General Exhibition of Arts and Sciences, but under the special superintendance, in this department, of the North London Photographic Association, will be a great success. A wall space in an admirably lighted gallery, in the Fine Art Department, of three hundred feet in length, is placed at the service of the committee for pictures. This, if covered for a space of six feet—that is, calculating nothing to be hung higher than eight feet nor lower than two feet from the ground—will give a space of eighteen hundred superficial feet, for nearly the whole of which applications have already been received. It will be seen from this that nothing can be hung badly, or beyond the reach of proper inspection without effort on the part of the visitor. The walls will be neatly coloured and draped, and the portion of the gallery devoted to photographs closed in, so as to form a complete department. The gallery is wide and spacious, and, it is probable, will be adorned with statuary down the centre aisle. There will be admirable space for stands of stereoscopes, &c., for which we hope application has already been made. If not, we fancy that although the specified time is past, it is, perhaps, not too late to secure a position for something good of this kind. All that is required, however, to make the Exhibition one of the most successful that has been held, is that applicants send in good pictures to fill the space already demanded, which will, in the course of a few days, be allotted.

We may mention amongst the inducements to special effort and interest on the part of contributors that some additional prizes will be offered by the committee. It is now contemplated to award not less than eight medals, provided the contributions possess sufficient merit to deserve them. The contemplated arrangement is as follows. Medals will be awarded for the following :—

For the most artistic picture or pictures.

For the best portrait or portraits.

For the best landscape or landscapes.

For the best picture or pictures by a dry process.

For the best enlargement or enlargements.

For general excellence in photographic lenses.

For general excellence in photographic apparatus and cabinet work.

For any picture, object, or process, which the jury may adjudge worthy of special distinction.

The last medal, it will be seen, is left entirely open to meet any special kind of merit, whether in discovery, invention, or practical skill which might be found to exist, but which could not be provided for beforehand. The objects of the other medals will at once commend themselves to photographers.

A clerk will be stationed in the gallery who will take charge of the sales of copies of pictures exhibited, and answer general inquiries.

An excellent space and capital arrangements have also been secured for apparatus in the philosophical instrument department.

Contributions must arrive at the Agricultural Hall with due instructions, which will be provided by the Secretary, on the 3rd or 4th of August, the work of hanging commencing on the 5th of that month, the Exhibition opening on the 16th. Free admissions for the season will, we believe, be provided for exhibitors. Communications and inquiries should be addressed to Mr. Barnett, the Secretary of the North London Photographic Association, 12, Ockenden-row, Southgate-road, N.

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TESTIMONIAL TO MR. SHADBOLT.

On Tuesday evening last a deputation of gentlemen met at the house of Mr. George Shadbolt for the purpose of presenting him with a testimonial of esteem and respect, as a souvenir of his long public connection with photography, which connection the exacting pressure of his business duties had compelled him some months ago to bring to a close. Mr. Shadbolt had held a prominent position in the history of photography ever since the introduction of the collodion process. An active member of the Photographic Society, at one time sitting at its council table, a ready and skilful debater, an ardent experimentalist, having a wide acquaintance with the physical sciences, and a cultivated gentlemen, he rapidly took high rank among the representative votaries of the new art-science. About eight years ago he assumed the editorial charge of the then *Liverpool Journal*, which under his care grew in influence and circulation, and in the course of time was enlarged, and issued as the *British Journal of Photography*, which continued under his able management until last year, when as we have said, the claims of more urgent duties compelled him to surrender all active interest in photography. For many years Mr. Shadbolt presided over the meetings of the North London Photographic Association, where his comprehensive knowledge of the art, tact, and general suavity contributed much to the success of the meetings.

It was with some of the gentlemen of this association that the idea originated of presenting to Mr. Shadbolt some recognition at parting of the esteem he had won in his long intercourse with them. A committee of gentlemen was formed, and steps taken to secure subscriptions. This was necessarily done privately, as publicity would have deprived the act of much of its grace. The privacy necessarily limited the number of contributions; but a handsome sum was nevertheless obtained, and embodied in a very beautiful silver epergne, the design consisting of a vine, the branches of which form candelabra, or hold glass dishes for fruit or flowers. The massive effect of the whole, and the graceful ornamentation of the vine leaves in chased work is exceedingly good. On a shield at the base the following inscription was engraved: "Presented to George Shadbolt, Esq., by a few photographic friends, on his retirement from public connection with the art, 1865."

A deputation from the committee comprising gentlemen associated with the Photographic Society, the North and South London Photographic Societies, and the Amateur Photographic Association, waited on Mr. Shadbolt, on Tuesday evening, to ask his acceptance of the testimonial. It was presented by Mr. Barnett, Secretary of the North London Society, with some brief but cordial and happily chosen remarks, and accepted by Mr. Shadbolt in a feeling speech expressing his deep appreciation of the gift, and the sentiment which suggested it; adding, "that it rarely happened that anyone should be so rewarded for simply doing that which had most delighted him to do, so long as his own immediate duties permitted him, by any amount of effort, to give it his attention. The deputation, consisting of Messrs. Barnett, Hill, Shave, Foxlee, J. Trail Taylor, A. Melhuish, H. P. Robinson, and G. Wharton Simpson, after partaking of the graceful hospitality of Mrs. Shadbolt, retired.

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COLLODIO-CHLORIDE OF SILVER FOR PRINTING ON PAPER OR GLASS.

A few further hints on the preparation and use of collodio-chloride of silver may be of service to those of our readers who have been experimenting with the new method of printing. We learn from the inquiries and specimens forwarded by correspondents that three or four specific errors are the most prevalent causes of trouble at the outset. For paper these are:—First, the use of an unsuitable sample of pyroxyline; second, the use of too small a proportion of pyroxyline; third, the use of too little free nitrate of silver; and fourth, the use of an unsuitable sample of paper. In working on glass the chief difficulty appears to have arisen from the film leaving the glass.

Printing on Glass.—We shall make one or two suggestions in regard to printing on glass first. The difficulty of the film leaving the glass may be entirely obviated by coating the edges of the plate, for about one-eighth of an inch, with dilute albumen before applying the collodio-chloride; after which, if reasonable care be used, there is no need whatever for the film to be loosened. We have found that by using a collodion of very good body that very good results may be obtained without the addition of citric acid; but still, on the whole, the latter is valuable. The use of lemon juice instead of citric acid has been suggested; it is possible that some advantage might be gained by the addition of the mucilage which the lemon juice possesses; but citric acid answers perfectly. It should be remembered that the presence of this acid in the collodion will tend to decompose the hyposulphite fixing solution, and that therefore the toning bath should be somewhat alkaline. If the print be immersed in hyposulphite, without any washing or toning, a rich sepia, a deep purple, or a pure black may be obtained by sulphur toning. How far this is a safe or permanent tone we cannot with certainty say; but there appears to be much less fear of instability in the sulphur toning of a print on glass than there is on paper. We have seen many of the excellent negatives of Dr. Diamond, which were simply intensified by immersion for some hours in an old hyposulphite bath until the deposit of silver was partially converted into a sulphide. Many transparencies are toned by the use, first, of bichloride of mercury, and then of hyposulphite of soda, producing a black tone, partly by the formation of sulphide of mercury, and partly by the formation of sulphide of silver. We have not met with any case in which pictures on glass so toned have changed at all, and it is possible that the collodio-chloride prints so toned may be quite as permanent.

The plan of printing on glass by means of collodio-chloride of silver, and subsequently transferring the film to paper, recently mentioned by Mr. Swan, and described by Mr. Frew, answers admirably, and gives exceedingly charming results. There are various modes of transferring; we have found either of the following very simple and efficient:—When the print is fixed, wash and dry; when dry, coat with a solution one part in four or five of water, with sufficient Chinese white (from the tubes of moist colour supplied by the artist's colourman) to give it a good white body. When this is dry, take either a piece of plain paper moistened, a piece of albumenised paper moistened, or a piece of paper coated with the gelatine and white pigment, and press firmly down, taking care to press out air-bubbles. When dry, the whole may be removed from the glass by running a penknife under the edge. It is always desirable that the glass should have been coated with wax before applying the collodio-chloride, to facilitate safe transfer. The instructions of Mr. Burgess for working the eburneum process, to which this method is analogous, will be found of service here. A rich effect for some subjects is produced by using cream-coloured paper instead of white for mounting. A very pretty effect of colouring may be produced by the use of either water-colours or powder-colours at the back of these prints, working on the surface of pigmented gelatine when it is dry. The colours show through, just softened by the film of translucent gelatine, and the effect very much resembles that of an enamel painting. We shall describe the operation in detail shortly.

Printing by means of Collodio-chloride on Paper.—From various specimens enclosed to us it is evident that sufficient attention is not given to a preliminary experiment we recommended some time ago. It is imperative that the collodion be of that character which is quite free from the slightest opacity or opalescence when dry. This is easily ascertained before adding the sensitive salts; and unless a little of the collodion poured on a plate of glass appeared quite transparent and scarcely distinguishable from the glass when dry, it is useless to add silver salts to it, as the slightest degree of opacity in the collodion gives the picture or paper a dull sunken effect. A cotton giving a horny contractile film is often transparent; but if it be too horny and contractile, another difficulty is introduced. Such a film, when once perfectly dry, is very impermeable, and has very great power of resisting aqueous solutions, which renders the operation of toning a very difficult one, the solution running greasily over the surface of the print, acting very slowly and irregularly. The chief disadvantage of a collodion with a very powdery film arises from the fact that it dries somewhat dead, and the print sometimes lacks brilliancy a little. The best kind of cotton is that which, whilst drying free from opalescence or opacity, gives a film of medium quality, neither very contractile nor very powdery. Such a cotton we have produced by using equal parts of nitric acid of a specific gravity of 1·420, and commercial oil of vitriol, immersing the cotton at a temperature of from 140° to 150° Fah., and taking care not to add more cotton than could be conveniently kept under the surface of the acids.

The quantity of pyroxyline to be added to the solvents will vary with its quality. Of such a cotton as that just described, about ten grains to the ounce would give results. It must always be borne in mind, however, that a good body in the collodion is necessary to vigour in the print, and that thin collodion is a fruitful source of the thin grey prints which many experimentalists have produced at the outset.

Another source of feebleness has been the want of sufficient free nitrate of silver, a difficulty which is, however, very easily overcome.

As we have before said, almost any hard-sized paper of good body may be used. If it be soft or absorbent, the free nitrate contained in the collodion sinks into the paper, instead of remaining on the surface in the collodion film, associated with the chloride there to do its office in aiding the production of vigour and brilliancy. An old thick *Rive* paper may be used sometimes without preparation, but the best paper we have used for the purpose is that prepared by Mr. Sanford for the Wothlytype process. If a thin paper be used with a contractile collodion, the prints are apt to curl in a very tantalizing manner, rendering the manipulation very troublesome.

Mr. Sutton, in a recent number of the *Notes*, states that some of Mawson and Swan's collodio-chloride of silver, which he mixed a month ago, has precipitated the whole of the chloride, leaving the collodion quite clear and insensitive. This is a somewhat singular experience, and we shall be glad to learn details of any similar case. A sample of Mawson and Swan's collodio-chloride, sent to us ready-mixed two months ago, remains altogether unchanged, and yields as good a picture to-day as when we received it. The sensitiveness is unimpaired, and the results delicate and vigorous. It has never once been shaken up since we received it, and the chloride of silver has not shown any tendency to precipitate. Some of the collodio-chloride sent out by the same firm in two solutions, which we mixed a month ago, remains unchanged and unprecipitated, working on glass perfectly. We have not tried that they prepare for printing on paper, but it is probable that the sample intended for glass would answer perfectly for paper if a little more pyroxyline and a little less citric acid were added. The various samples we have made of collodio-chloride ourselves have remained without precipitation; a portion of the first quantity, made now nine months ago, still continues without signs of precipitation. Mr. Sutton concludes that "collodio-chloride of silver is no more than an imperfect mixture of the ingredients, and not a chemical compound, as has been supposed." We have never ventured to suggest that the chloride of silver was held by the collodion in other than a mechanical suspension. Nevertheless, we have felt, in examining the matter, strongly inclined to believe in some chemical combination between the materials. Here is a singular circumstance in corroboration of such a view. We took a spirit varnish of considerable body, and added nitrate of silver, and then the requisite chloride, treating it in fact just in the same way as we had treated collodion. The chloride of silver formed, instead of remaining in suspension as in the collodio-chloride, quickly assumed its characterestic curdy appearance, and precipitated entirely within an hour. If the viscous character or density of the fluid were the sole cause of chloride of silver remaining in suspension in collodion, how was it that a thick spirit varnish did not retain it in suspension in like manner? We shall be glad to hear of other cases of precipitation, if they have occurred; but at present we are led to believe that there is something exceptional in the sample with which Mr. Sutton has been working, as he also describes the film it gave as lumpy and uneven. In the samples with which we have worked the film is perfectly even and homogeneous, so much so that when dry on opal glass it is almost impossible to discover that the glass is coated at all. Such a film is necessary to really good results, and experimentalists should not be content with any other.

ECHOES OF THE MONTH:

BY AN OLD PHOTOGRAPHER.

Mr. Sayce's Process—North-Eastern London Exhibition—The Exhibition of Miniatures—"Fun"—Absence of Actinism — Mr. Moens and the Brigands — A Large Order—The French Invasion—The Societies.

Of the many processes of different kinds that are invented and re-invented, it is difficult to select those which are really worthy of a trial, it so often happens that the inventor's glowing description of the value of his discovery is not borne out by experiment. Others, again, are brought so modestly before the world that they escape attention and become lost. I hope this fate will not happen to the admirable process Mr. B. J. Sayce has just given to the world, the object of which is to do away with the nitrate bath entirely, and which he has so well described in a recent number of the News. I have seen some prints taken from negatives produced by the dry method he describes, and was astonished to find a perfect absence of that peculiar quality by which a dry plate might always be known, and from which the best productions of the best dry-plate men are not entirely free. They have a richness and transparency I have never before seen, except in perfect photographs taken with wet collodion. Another merit of Mr. Sayce's paper is, that it is written to be understood, which can scarcely be said of some papers that have been recently written.

There is every prospect of the North-Eastern London Exhibition—the photographic department at least—being a good one, a large demand for space having been received by the secretary, both for pictures and apparatus. The photographs will have the south gallery almost entirely devoted to them. The gallery will be shut off from the rest of the exhibition, and will be ornamented with sculpture, which will afford a pleasant relief to, and will enhance the value of, the photographs. The apparatus will be exhibited in the Philosophical Instrument Department on the ground-floor. Medals will be awarded in both classes.

It has been said that no two faces were ever born into the world exactly alike. If the three thousand and odd miniatures now exhibiting at the South Kensington Museum are true to nature, they go far towards proving that this statement is not strictly correct, and to show that special varieties of features prevailed at different times, or that, whether the persons represented had them or not, the limners of the periods made no difficulty about adjusting the personal appearance of their patrons to the prevailing fashions. This is art, with a touch of artfulness, not very honest, and impossible, fortunately, to photography. Precedents for many faults supposed to be peculiar to photographs are to be found in this loan collection of miniatures. Do you want badly lighted faces without shade, or roundness, or relief you will find them in the portraits of Elizabeth and the ladies of her court, who flattered her by assuming her ugliness, and allowing a patch of pink with faint traces of eyes, nose, and mouth to represent their features. Do you require authority for balconies, pillars, curtains hung up in the sky, Italian lakes, book-cases and chimney-pieces whose perspective looks every way at once but never finds the point of sight, and all the horrors which scene-painters without a knowledge of art, and pseudo-artists without a knowledge of the requirements of photography, have added to the photographer's "requistes" you will find them here. Should you want some splendid examples of elaborate bad taste, you will find them in nearly every miniature painted before photography came to reform the art, or destroy it altogether.

Fun has been assisting candidates for the coming elections to write their addresses. Art-critics who revile photography as to matter of fact should learn the following from Sir Bulwer Lytton's address by heart:—"Do not forget the identity of the Truthful and the Beautiful. It is an unstatesmanlike falsehood to say that they are not The Same Concern."

Photographers have been grumbling sadly about the absence of actinism in the light during the hot weather. It appears to be an established fact that after a long continuance of fine weather it is very difficult to obtain good pictures; the exposures required are very long, and the resulting negatives are hard and devoid of half-tone. Similar effects are experienced in India and other hot climates, where it is found that apparently the most brilliant light is comparatively useless for photographic operations. As long ago as 1855, Mr. Rejlander noticed a similar phenomenon, which he described in the discussion on his paper on "The Two Ways of Life," read before the

Photographic Society in 1858, but for which he was not able to assign a satisfactory cause. Some photographers ascribe it to excessive dryness of the atmosphere, and place wet cloths about the floors of their glass rooms; but I have never found any perceptible advantage to be gained from this proceeding. The subject is well worthy the attention of those who are fond of investigating the philosophical aspects of our art.

We are now getting used to photographic pirates, but photographers have never been prepared for those land pirates—brigands. The capture of Mr. Moens by these wretches is now well known, not only to all his brother photographers, but to all the world. It is an astonishing thing that a small band of men should be able to kidnap a traveller in the heart of a great country like Italy, and that he should remain some weeks unrescued. In England a couple of detectives, stupid as they sometimes are, would have settled the matter in a few days. It would be against international etiquette, I suppose, to send out a few companies of volunteers; they would enjoy the job much more than the brigands would appreciate their visit.

Perhaps the largest order ever given for photographic apparatus has just been executed for the great Trigonometrical Survey of India by Mr. Dallmeyer. It consisted of a complete set of apparatus for copying plans and maps, including a camera for plates, 18 × 16, fitted with triple lens, which boasts, amongst its other good qualities, of being the best copying lens yet made; three lithographic presses, bales of paper, quantities of zinc plates, and all the necessaries for the photozincographic process as practised at the Government works at Southampton, under Sir Henry James. The apparatus and materials were packed in fifty cases, and filled several waggons. The money value of the order was upwards of £1,100. It is a satisfactory proof of the vast progress photography has made of late years, not only that it should be employed so largely by Government, but that a private establishment should exist capable of executing such an order in a very limited space of time. Mr. Dallmeyer is now employed on an enormous lens and camera for the Italian Government. The camera is so large, indeed, that, like the family picture in the "Vicar of Wakefield," it was found too large to get out of the house, and the side of the workshop had to be removed to allow it egress.

After the fifty years of peace, we are to have another French invasion — this time a peaceful one. A French horse wins the Derby, and our neighbours carry off many prizes which Englishmen should strive to retain. The latest arrival from Paris is M. Disderi, said to have been the inventor, and who was certainly the introducer, of cartes-de-visite. He has taken a house in Brook-street, Hanover-square, and is now busily engaged in fitting it up in a gorgeous manner, for the purpose of eclipsing all similar places devoted to photography.

At the Photographic Society the paper was by Mr. Pettitt, "On Photo-Binography," in which he endeavoured to demonstrate that if a stereoscopic negative be taken by two lenses, and this negative is enlarged so that each of the two images falls on the other, the single picture enlargement produced will be stereoscopic. I need scarcely say that this heretical idea, which is not new, was energetically refuted by the meeting.

A great portion of the evening was devoted to the exposure and refutation of a series of small scandals affecting the position of the Society and some of its officers. The business was, probably, as necessary to be done as it was unpleasant to do and offensive to contemplate. The chairman, with a too-tender-consideration, veiled the discreditable actors in the matter, and although their names were matters of common talk, I will, so far as these Echoes are concerned, leave them in the obscurity the chairman sought for them. I overheard some one, irreverently parodying the lines of the Laureate, style them as

> "The shadows cloaked from head to foot
> In dark disguise of A. B. C."

A large number of interesting articles were exhibited, too numerous to mention in this place. Those which excited the greatest interest were the Carbon prints taken by M. Poitevin in 1855. These were exhibited between glass plates, so that both sides might be seen. Besides the many proofs of their genuineness that have been given, they bore the unmistakable impress of the ten years which have elapsed since their production. We may congratulate M. Poitevin on the satisfactory manner in which his claims to be the inventor of Carbon printing have been substantiated.

Some foreign gentlemen were anxious to sell a printing process to the Society. The price, a trifle, £800! It is plain that the poverty of the Society has not got abroad. The inventors state that the following chemicals are used :—

SO_3 HO, ClH, NO_5, HO, SH.

At the North London Association Mr. S. Burr read a paper on the employment of photography at the Royal Observatory at Greenwich, illustrated with diagrams which attracted marked attention from the few ardent members who attended the meeting in spite of the heat.

At the South London Society a paper was read which called forth some very sensible comments on the art-progress of photography not coinciding with the opinions of the writer. In the course of the discussion Mr. Blanchard suggested the desirability of forming a library of reference in connection with the Society. This is a very excellent suggestion, and would be of great use if a room could be found to contain the books, and if the Society could afford to pay a librarian to attend periodically to give them out. A practicable substitute for the library might be found in the formation of a photographic book club, which could be worked successfully with very little trouble. Let a certain number of members agree to subscribe so much a year. With this money books, suggested or voted for by the members, should be bought. A list of members *in the order of their addresses* should be inserted in each. The secretary should then send a volume to the member who lives nearest to him, who, after keeping it for a given time—a week or fortnight, according to the size—should forward it to the next member on the list, and so on. When the books accumulated, if no better method of disposing of them occurred, they might be sold annually by auction to the members.

The Secretary read the Annual Report of the Committee, which showed the Society to be in a flourishing condition, and contained a list of the numerous and for the most part valuable contributions that had been read to the meetings.

The meetings of the Provincial Societies are concluded for the season.

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TO DUBLIN AND BACK, WITH A GLANCE AT THE EXHIBITION.

BY J. WERGE.*

Continuing our general survey, we stumble upon many things of considerable interest. But, as our space will only allow us to particularize those articles which have a photographic attraction, direct or indirect, we must as far as possible imagine ourselves something like animated photometers, for the time being, registering the aspects, changes, and remarkable phenomena connected with our art, and whatever can be applied to photography and the use of photographers; or whatever photography can be applied to, artistically or commercially considered.

Of some things non-photographic but of interest to photographers as well as others, we may be induced to say a little; but of most subjects foreign to our profession we shall simply say to our readers, "We have seen such wondrous things, go ye and do likewise."

We finished our last paper with a few comments on what was photographically interesting in the province of Nova

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* Concluded from p. 307.

Scotia. Passing from that to the provinces of the Lower and Upper Canadas, which are very properly placed next door to each other, we are struck with some very good and interesting photographs of Canadian scenery, both plain and in colours, and a frame of portraits of the delegates of the British North American Confederation. Samples of all kinds of native and Indian manufactures, and specimens of mineral ores, chiefly iron and copper, are also displayed here.

Pursuing our way southwards from the Colonial division of the galleries, we come to China and Japan. The geographical and relative positions of the countries exhibiting are not strictly adhered to in the plan of the exhibition, so we must of necessity make some "long legs" and experience some imaginary transitions of temperature during our journey of observation. In Japan we stop to look at a life-sized group of female figures, representing a princess at her toilette, attended by four female slaves, books illustrated with woodcuts, plain and coloured, bronzes and many other articles of art and manufacture, by the Japanese, of much interest.

In China there is a State bedstead of great beauty, books of paintings upon rice-paper, and many beautiful bronzes, carvings, and other specimens of Chinese art.

We pass through Turkey, and next come to Siam, but the latter country does not exhibit much except of a "seedy" character. We admit we are sometimes addicted to making puns, but the Siamese send puns for exhibition. There is an article called "pun," which is "prepared lime, coloured pink with turmeric," but to what use it is applied we have not been enlightened.

Passing through France, Austria, Prussia, Belgium, and Holland, without stopping to notice anything particularly, and turning into the south corridor, we enter the Water Colour Gallery, which we quickly leave, sighing, "How unlike that beautiful and attractive section of the Art Treasure Exhibition at Manchester in 1857!" Hastening into the Central Picture Gallery, we are much struck with the different appearance it presents, and find numbers of ladies and gentlemen admiring the numerous productions by painters belonging to the various foreign schools. Among these works are some grand subjects, both in historical and ideal composition, and landscape representations. This gallery has a particularly noble and handsome appearance. It is oblong, well lighted, and open in the middle, by which means the Sculpture Hall, which is underneath, is lighted. The sides of the gallery next the open space are handsomely railed round, and pedestals, with marble busts and statuettes on them, are tastefully arranged at intervals, leaving room enough for you to look down into the Sculpture Hall below. What with the fine pictures on the walls and staircase, and the noble statues in marble about and below, you cannot but come to the conclusion that this is a noble temple of art.

We next enter the east front room, which contains the works of the Belgian artists. Many of these paintings are very finely conceived and executed. The largest and most striking of them is the "Defeat of the Duke of Alençon's Troops by the Citizens of Antwerp," painted by A. Dillens.

Now we enter the Great Picture Gallery, which is devoted to the painters belonging to the British school. Here we find many of the well-known works from the National Gallery and Kensington Museum. There are examples of the works of Callcott, Collins, Wilkie, Wilson, Turner, Landseer, Mulready, Etty, Egg, Ward, Leslie, and a host of others. Her Majesty the Queen also sends several pictures from her private collection, as examples of the works of Winterhalter, Thomas, and Stanfield. Nearly all the British artists are creditably represented in the Dublin International Art Exhibition.

We next come to the Collection of Ancient Masters in the North Gallery, which we enter from the North Corridor. To this part of the Fine Art Exhibition the Earl of Portarlington is the most liberal contributor. He sends examples of Titian, Rubens, Carlo Dolci, Tintorette, Canalette, Claude, Watteau, Rembrandt, Gerard Dow, Schneiders, Vaudevelde, Sir Joshua Reynolds, Sir Peter Lely, and others. The Marquis of Drogheda also sends several examples of the same masters, some of them very fine ones. Sir Charles Coote sends a great many paintings; among them a Murillo, a Guido, and a Gainsborough.

Thence we pass into the Mediæval Court, where we find nothing but croziers, sacramental cups and plates, carved panels for pulpits and clerks' desks, reminding us of "responses" and "amens." These we leave to Churchmen, enthusiastic Puseyites, and devotees of Catholicism. And we wend our way round the galleries, passing through Switzerland and Italy into the United Kingdom, where we stop to examine some of the art manufactures peculiar to Ireland, and are particularly interested in the specimens of Irish bog oak, carved most tastefully into various ornaments, such as brooches, pins, paper-knives, &c., and sculptured into humorous and characteristic statuettes. The most noticeable of that class of Irish art and industry is a clever group, entitled, "Where's the man that dare tread on my coat?" This really humorous and artistic statuette is one of a group of two. One is a rollicking Irishman brandishing his shillelah over his head and trailing his coat on the ground, which is the Irishman's challenge for a fight at such places as Donnybrook Fair. The other Irishman, who is equally ready for a "row," is in the act of treading on the coat, as an acceptance of the challenge. The story is so cleverly told that we almost fancy we see the fight begin, and hear the shillelahs cracking crowns in a genuine Irish row.

Pushing on through India to the British Colonies again, whence we started, we descend to the ground-floor, and resume our survey of Sweden, Norway, Italy, and Rome, and turn into the Music Hall, which is on the south side of the entrance and Statuary Hall. Here we find the organ-builders at work on the grand organ, blowing up one pipe after another, and producing such volumes of inharmonious sound that we are glad to leave them to the full and hearty enjoyment of their pipes, chords, discords, and bellows-blowing. The walls of the Music Hall are nearly covered with cartoons and paintings of a high class, some of them so high that we require an opera-glass to bring them within the range of our visual organs.

We next enter the Sculpture Hall with a view of examining the statues and describing them carefully. But they are so numerous that we can only find space to call attention to the most striking. There are over 300 pieces of sculpture from various countries, comprising colossal and life-size figures, groups, busts, statuettes, and alto-relievos in marble and bronze. The most attractive of the marble statues are "Michael Angelo, when a child, sculpturing the head of a Faun" (his first work), by Emilio Zocchi, of Florence. The earnestness of purpose and devotion to his task are wonderfully expressed in the countenance of the boy-sculptor. Plying the hammer and chisel actively and vigorously, every part of the figure betokens a thorough abandonment to his occupation. A very remarkable work by a lady sculptor—Miss Harriet Hosmer—entitled "The Sleeping Faun," is the very opposite to the other, in its complete abandonment to repose. This fine statue has been purchased by Mr. Guinness, and we were told he had given a munificent sum for it. Another piece of exquisite beauty and daring skill in marble working is "The Swinging Girl," by Pietro Magni, of Milan, the sculptor of "The Reading Girl," which attracted so much attention in the International Exhibition of 1862. The figure of the girl swinging is beautifully modelled, and entirely free from contact with the base; and, is supported only by the swing attached to the branch of a tree, and the hand of a boy giving action to the subject. "Ophelia," by W. C. Marshall, is perhaps the most poetic conception of the loveliest and most mournful of Shakspeare's creations that has ever been sculptured. It is almost impossible to look at this touching representation of Ophelia in her madness without exclaiming, in a modified quotation of her own description of Hamlet,—

"O, what a gentle mind is here o'erthrown!"

But we must stop. To go on in this way describing all the beautiful works of art in the Dublin Exhibition would fill a volume. Already we have allowed our admiration to carry us beyond the limits we had assigned ourselves. We have been tempted to describe more than photographic works, but none that have not a value artistically or otherwise to photographers. We recommend all our readers that possibly can to go and see for themselves. The trip is a very pleasant one and need not be expensive. Nor need much time be spent unnecessarily. A week's absence from business will give you five clear days in Dublin, the other two only being occupied in travelling. Five days will be amply sufficient to see the Exhibition and the "extraneous lions" of Dublin also. If your time is limited, give a carman a job to "rowl" you to the principle places of interest. But "by all manes" select a rough, ragged, red-headed, laughing-faced Irishman for your jarvey, and depend upon it he will keep you in good humour during the whole of your trip. And every time you come to a public-house he will say his "horse wants a dthrink," and "Won't yer honours have a dthrop?" as if he was going to stand treat; but of course you know what he means; besides, the idea of allowing a carman to treat his fare is not to be entertained for a moment, nor can you resist the good-humoured intimation of his desire to drink your health, for which honour, as a matter of course, you pay costs.

Having endeavoured to conduct our readers to Dublin, and give them a glance at the Exhibition, photographically and generally, we shall now take our leave of the capital of Ireland, and return to town in much the same manner as we went. We leave the Irish capital at 1.30 in the afternoon, and, after a pleasant and quiet run across the Channel, enter Holyhead harbour about seven o'clock. This arrangement gives you an opportunity of seeing the Welsh coast to the best advantage as you approach. Stepping into the train which is waiting our arrival, we are speedily on our way home. At Rugby we have to change, and wait a little; but before leaving there we pass the sign which only old masons and travellers know, and are provided with a first-class bed and *board*, and so make ourselves comforfortable for the night. We know nothing more of the remainder of the journey. Old Somnus has charge of us inside, and an old kind-hearted guard takes care of us outside, until we are aroused by the guard's "Good morning, gentlemen!" about six o'clock, a.m., within a few miles of Euston Square. In conclusion, we sincerely recommend as many of our readers as can to take a trip "to Dublin and Back," and a Glance at the Dublin International Exhibition.

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ON A NEW CARBON PROCESS.

BY M. CAREY LEA.*

I have been engaged at several times during the past year in making experiments upon a new carbon or pigment process. At one time I hoped a great deal from it. Those hopes have only been in part realized. I propose now to explain how far I have succeeded in carrying it, intending, perhaps, to make further efforts in it, and inviting such as may choose to experiment also, and endeavour to bring it into a shape sufficiently perfect for practical use.

This method differs essentially from anything that has yet been suggested. Not in mere detail or contrivance, as Swan's, Blair's, Poitevin's, and Fargier's differ from each other, but essentially. It is true that, like those processes, it depends upon the use of gelatine and bichromate of potash. But the points of distinction will be at once evident when I say that I do not, as is done in all those cases, mix a pigment with the bichromated gelatine, and render it insoluble by the action of the light. All the processes just mentioned resemble each other in that particular. But in mine, the bichromated gelatine is exposed to the light without any admixture of pigment. Another still more striking difference is, that in all the first-mentioned processes, it is the sunned portion which constitutes the dark shades of the picture. In mine, on the contrary, the sunned parts become the lights, and here is a cardinal, absolute difference between mine and all other gelatine-carbon processes yet devised. It naturally follows from what I have just said, that from a positive I obtain a positive, and from a negative a negative.

I shall first describe in general terms my method, and then proceed to such details as may be necessary to experimenting with it.

Having prepared paper with bichromated gelatine, I expose it under a positive or negative for a brief time to the sun. I then throw it into water, and wash it completely white, so that the picture disappears. The gelatine, which has been acted upon by the sun, has undergone a change which greatly diminishes its adhesiveness. I now rub a pigment gently over it with a tuft of cotton. The pigment adheres to those parts only which have not been hardened by the sun. The print is next to be held for a few moments under a stream of water, which cleans off the whites, and the picture is finished.

It will be seen that nothing can be more simple than this process. The blacks are deep, the whites clean. The specimen which I enclose was printed from a glass positive of a bank note. It will be seen that the finest lines are well preserved. The whites have a peculiar silvery, metallic appearance, due to the altered gelatine. The specimen is one showing only whites and blacks, and no half-tone. Half-tone is, however, obtainable by this process, as one would naturally expect from the character of the method; for where the action of the sun has been partial and incomplete, the gelatine must be partially hardened, and so partially refuse the colour. As yet, however, my specimens with half-tone are not sufficiently to my liking, for me to think them worth showing. It is very evident that here the half-tones cannot be undermined and washed away, as *the lights are embedded in the shades*, not the shades embedded in the lights, as in what is called "carbon direct printing."

I shall next proceed to describe the details of the method.

1. *Preparing the Paper.*

Prepare the following solution:—

Gelatine	650 grains.
Water	8 fl. ounces.
Cold sat. sol. bichromate of potash	4 fl. ,,
Glycerine	½ fl. ounce.

Select a good gelatine; that which I have used is Cooper's American gelatine, which, though scarcely equal to Cox's sparkling gelatine, gives good results. Different specimens of the same gelatine vary a good deal, and as it is desirable to get rid of any contamination with that sort of gelatine which is soluble in cold water, I recommend to proceed as follows: Pour the eight ounces of water over the 650 grains of gelatine, and let it stand and swell for some hours. Then pour off the unabsorbed portion of water into a measuring glass, and replace it with an equal quantity of fresh. This should be repeated a second time. The vessel containing the gelatine is then to be set into warm water till the solution is complete; the solution of bichromate is warmed and added. The whole is then let to stand for half an hour, either in a large vessel of water just so warm that the hand cannot be borne in it for more than a moment, or on a stove at an equivalent temperature. The vessel is left uncovered. The bubbles rise to the top, a skin forms entangling them, and the whole is removed at once, and without difficulty. In all processes in which a strong solution of gelatine is used, bubbles are an especial trouble, and the above furnishes an easy method of at least starting clear of them.

Take next a 10 by 12 porcelain pan, set it in another of equal size or larger, containing hot water, after having first let hot water stand for some minutes in the upper one also, to prevent chilling the gelatine. Float any good photographic paper upon the solution for about three minutes. But here it is necessary to say a few words about the manner of laying down and taking up the paper. If this is not thoroughly understood, at least as respects the taking up, the experimenter may try till he is utterly discouraged before getting a single good sheet; whereas, by following these directions, he will rarely get a bad or defective one.

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* From the *Philadelphia Photographer.*

Laying Down.—Lay the paper down very much as you would an albumenized sheet on a positive bath. Hold the sheet by the middle of the two ends, bring these somewhat near to each other. Now bring the farther side of the loop, that is, the upper middle part of the sheet, down upon the liquid. Gradually lower till the middle touches all the way across. Next open out the hands till the whole surface is brought down.

Taking Up.—The taking up is a much more difficult part than the laying down. On lifting the paper in the ordinary way, or without particular precaution, it will be found full of streaks, caused by the thickness of the liquid, and its tendency to rapid gelatinizing when exposed to the air in thin strata. To obviate this, take the paper by two corners at one end, and lift it suddenly and completely off of the liquid with one rapid jerk—this brings up a great quantity of liquid with the paper, which flows off again in a large wave, leaving the paper beautifully smooth and even behind it. I said to jerk it completely off of the liquid; but it is better to lift it so as to leave the lower edge of the paper just touching the surface, as then the excess flows without making bubbles. After draining a few moments, the paper is to be pinned up to dry. It is scarcely necessary to say that all this should be done, either in the dark-room, or by gaslight.

Before another piece is laid on, the surface of the liquid must be examined for bubbles, and any that may appear must be removed with a bit of blotting-paper.

The object of the glycerine is to render the paper flexible when dry; without it, the paper is very unmanageable.

2. *Exposure.*

The exposure is to be in the direct sun; time according to the thickness of the positive, a minute to a minute and a half or two minutes, but the latter only with very dense films. With a good sun, and an average positive, a minute will generally be found sufficient. The results of over and under exposure will be fully explained hereafter. The deep shades of the finished picture should be, at this stage, perfectly bright, clear yellow, without the slightest darkening

3. *Washing.*

When the printing is finished, the prints are thrown into water, which is to be several times changed in order to get rid of the soluble chromates. They are then allowed to lie in clean water for a period which should be not less than twelve hours, nor more than forty-eight. Twenty-four hours is a good time. As a general thing, any time on the day following to that on which the printing was done, is a very suitable time. It is scarcely necessary to remark that all the washing water must be cold—hot or warm water would dissolve out the gelatine; and, for the same reason, gelatine partly soluble in cold water, is to be avoided, or, at least, the soluble portions are to be removed in the same manner already explained.

At the end of the washing, it will be found that the brown image, produced by the exposure in the printing-frame, has so completely disappeared that it is not easy to tell which is the right side of the picture. Sometimes a slight difference in colour is perceptible in certain lights, but more commonly the operator is obliged to guide himself by the feelieg of the gelatine side to the finger, which enables him to distinguish between the front and the back.

4. *Colouring.*

A little experience is required to put on the colour exactly right. Taking the print out of the water, place it, face up, upon a smooth board, or a sheet of clean paper. Press the face gently with a sheet of blotting paper, to remove the superfluous water. Throw on it some fine lampblack, take a tuft of cotton slightly moistened, and spread the lampblack with it over the print, rubbing in gently. With too much or too little pressure, the operation fails; the proper amount can only be learned by careful trials; next, hold the print under a tap, or let the water flow over it, carrying away the excess of lampblack, and clearing away the lights.

Failures.—Streakiness through the print, and black lines indicate too much pressure with the cotton. Repeat the whole operation, commencing with the blotting off of the excess of water. Or the fault may arise from the cotton having been too dry.

Colour not taking well in the dark parts.—This may arise from either of several sources. Either it indicates that the print was over-exposed, which, of course, is fatal, or it may arise from too little pressure with the cotton having been used, or, more probably, from the cotton having been too wet. The best thing to be done is to repeat the colouring, washing off the first trial.

The print is next dried, either by hanging up or by spreading out on blotting paper.

Different pigments vary very much in respect to working clean. Lampblack is the best form of carbon that I have tried. Graphite will not do at all. Different specimens of lampblack vary somewhat in their results. The very lightest and loosest is what answers best, such is generally sold in paper cases or bags. Frankfort black does not work well.

This process admits of some curious applications. As the colour is put on *after* the rest of the operation, it is not necessary that the whole of the colour should be the same. A positive produces a positive. We may thus, for example, lay a fern, fresh or dry, upon the prepared paper, and by finishing with a green pigment, we have, by a single operation, a green positive of the original. So we may take dried plants, and in rubbing in the colour, use green for the leaves, and a characteristic colour for the flowers. The common chrome green (so called, made up of chrome yellow and prussian blue) takes very well, and answers well for leaves.

An engraved print on thin paper, even without oiling or waxing (or, rather paraffining), will give a good impression.

As I have already mentioned, the whites in this process are peculiar, and not at all like white paper, but metallic and silvery looking.

I have found it advantageous in this process to make use of a weak acid bath before exposure. Such a bath alters the appearance of the unexposed paper very much. It causes it to look as if the whole sheet had been exposed to, and and darkened by light. When such paper is exposed under the positive, the exposed parts scarcely become much darker than the already dark paper, and the picture is very indistinct. But, by washing in the manner already described, even this dark colour comes out, and the picture seems to develop better under the action of the pigment and the cotton.

This acid bath consists of water with 4 per cent. of either common nitric or common chlorhydric acid. The effects of the two are very similar, but I prefer the latter. The sheet prepared with gelatine, after drying, is thrown into this bath; and as this bath would dissolve out the greater part of the bichromate, it is advisable to add bichromate to the acid bath, in order to keep the sensitive surface properly charged with it. In a 15-ounce acidulated bath, dissolve half an ounce of bichromate of potash.

Where it is intended to use this acid bath, it would seem scarcely necessary to add bichromate of potash to the gelatine solution, inasmuch as that reagent is supplied by the bath subsequently applied. I have tried this; it has, of course, the advantage that the gelatine sheets keep indefinitely, and are sensitized only as wanted. But it has seemed to me that I did not in this way get results quite so good as when the bichromate was applied in the original solution also. The print of the bank-note was made with bichromate in the gelatine, and with an after bath of water, bichromate, gelatine, glycerine, and chlorhydric acid, in the proportions already given.

It seems scarcely necessary to say that, when the acid bath is used, the glycerine must be placed in it, and not in the gelatine, as otherwise it would be removed by the acid bath. There is a disadvantage in this, that the acid bath will keep only a few hours, as the chromic acid, set free by chlorhydric or nitric, begins very soon to react upon the glycerine.

In concluding, I wish to say that I should be greatly misunderstood, if it were supposed that I put forward this process as a complete method capable of giving results equal to those of some of the matured carbon processes, in which one clever experimentalist has built up on the results obtained by another, until the remarkable results that we have lately seen have been obtained. But I consider it interesting from its novelty, and from the curious results which may be obtained from it. And it is, perhaps, susceptible of improvements which may place it among the permanently useful processes of photography.

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REPORT OF THE COMMITTEE FOR EXAMINING THE COMMUNICATIONS RELATIVE TO THE INTENSIFYING NEGATIVES BY CHEMICAL COLOURATION.

BY M. DAVANNE.

Gentlemen,—At a previous meeting you have received two communications on the subject of the colouring of negatives by iodine and the salts of mercury. These communications, which reached you on the same day, present this singular anomaly, that both being made by practical men, they completely contradict each other, for while M. Piard found in the yellow colouration of negatives a very vigourous means of intensifying, General Mangin assured you that a completely yellow negative gains nothing in intensity.

Surprised at such a formal contradiction, you have wished a committee to verify the processes communicated, and you have charged M.M. Bayard, Davanne, Girard, and Perier with the task of examining them. I have the honour of rendering you an account of the labours of your committee.

By a very singular coincidence it happens that neither of our honoured correspondents is wrong, for the facts justify both assertions, as the specimen submitted to your inspection will prove. For if we submit a negative, fixed either in hyposulphite of soda or cyanide of potassium, to the action of iodine, and carefully wash it, we may observe three successive phases. The iodine commences by giving a black colour to the proof, and if we immediately stop the action, this colouration has no influence upon the negative; if the action continues a few moments the intensity increases, and an energetic intensifying takes place, which resists even the varnish; but if the action be continued until the coating of silver is converted into iodide and becomes completely yellow, instead of the intensifying announced by M. Piard, a considerable attenuation takes place, and the light, readily passing through this light yellow film, darkens all the whites of the positive paper.

We may conclude from this first experiment that free iodine can, up to a certain point, intensify negatives, but on condition that the action be not sufficiently prolonged for all the silver to be converted into iodide, for then the resulting yellow film is more permeable to light than the original colour.

The light yellow colour of the negative may, it is true, be transformed into a golden yellow, more brilliant and darker, if we pour a solution of bi-chloride of mercury upon the yellowed picture. A small quantity of iodide of mercury is then formed, which communicates its rich tint to the negative; at the same time an evident intensifying takes place, on condition of leaving the negative to dry after having simply gummed it; but when we proceed to wash it in order to remove the excess of the reagent, this tint becomes rapidly weaker and disappears, and the picture, instead of being intensified, becomes much weaker than it was at first.

On the other hand, we have observed that this mode of intensifying muddles the half tones, and consequently impairs the sharpness of the picture. Lastly, another consideration must, in our opinion, lead us to reject this reaction, which is, that negatives thus treated cannot support the resinous varnish upon which their preservation depends, and renders them available for printing. For, under the action of the varnish, the colour immediately becomes weaker, and the negative reassumes that general transparency communicated to it by the prolonged action of iodine.

From this array of facts we perceive that it is possible to maintain, with M. Piard, that negatives can be strengthened with iodine, but we must not attribute this strengthening to the yellow colour assumed by the picture, since experience has shown us that it was considerably weakened; we must, on the contrary, stop the action of the iodine before the yellow tint displays itself.

We may also say that in causing the bichloride of mercury to follow the prolonged action of iodine, we obtain a negative more impermeable by light; but then we must neither wash nor varnish it, and we cannot recommend such exceptional conditions; also, in rather adopting the opinion of General Mangin, we say that the colouring of negatives yellow appears to present no advantage over ordinary methods, and we prefer the employment of some of the processes generally followed.

Bulletin de la Société francaise de la Photographie.

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Correspondence.

FOREIGN SCIENCE.

[from our special correspondent.]

Paris, July 1*st*, 1865.

A few months ago, Messrs. Maréchal (of Metz) and Tessié du Motay offered some very remarkable vitrified pictures to the French Photographic Society. The same gentlemen have now forwarded to the Academy of Sciences some further specimens, accompanied by a description of the processes they employ. The following are the principal points:—

Four parts caoutchouc are dissolved in 100 parts benzoin, and to this solution is added one part normal collodion dissolved in ether. This preparation is poured over the the matter—crystal, glass, enamel, fayence, porcelain, &c.—on which it is intended to take or to reproduce the photographic image to be vitrified. You now dry this coating in the air or in a drying-stove, till it forms a thoroughly adherent pellicule. Upon this you pour iodurated collodion, which combines intimately with it and acquires the same solidity. You sensitize with a nitrate of silver bath, and expose. A latent image is produced, which is brought out by the aid of one of the developing liquids used in ordinary processes. It is then fixed by two baths in succession containing, the one iodo-cyanides, and the other alkaline cyanides. The image is then immersed for a few minutes in a solution of sulphate of protoxide of iron, of pyrogallic acid, or of any other substance which reduces salts of silver. The pictures are intensified by the reaction of pyrogallic acid, gallic acid, formic acid, or of sulphate of protoxide of iron upon an acid solution of nitrate of silver. This intensifying requires from 4 to 6 baths for images intended to be seen by reflection, and from 12 to 15 for transparent ones. During this operation, the images are likewise washed several times in alternated baths containing iodo-cyanides and alkaline cyanides, and immediately after in solutions of sulphate of protoxide of iron, of pyrogallic acid, or of any other reducing acid. The successive baths of iodo-cyanides and of alkaline cyanides completely dissolve the non-adherent argentic powders precipitated over the surface of the picture by each intensifying bath. Washing in these reducing baths renders the metallized layer once more neuter or acid, and thereby augments the ulterior action of the intensifying bath.

When the image has been treated thus, it is immersed for one or several hours in baths of chloride or of nitrate of platinum; or else in alternate baths of chloride of gold and of nitrate of platinum; or, lastly, in baths of chloride of gold.

During this immersion, the silver of the image is in part replaced by platinum, or by a mixture of platinum and gold, or by gold alone. This substitution has for object to change either the colour or the nature of the image after vitrification. Thus, when dark-green images are to be obtained in the muffle-furnace by the reaction of silicic or boracic fluxes, the images are first immersed in a bath of chloride of gold or of nitrate of platinum. If, on the contrary, black tones are desired, the images are immersed consecutively in baths of chloride of gold and of nitrate of platinum. For gold-toned pictures, salts of gold only are employed.

On leaving the bath of platinum or of gold, the image is plunged into a bath of alkaline cyanide or of ammoniacal water at its maximum concentration. Then it is covered with a varnish of unctuous caoutchouc, or of gutta-percha; after which it is submitted to the action of a muffle-fire, which burns the organic matters, and lays the metals bare. Lastly, the image is covered with a flux and submitted to the fire, which vitrifies it. The temperature must rise to orange-red.

The method, as will be seen, is not free from complication, and the communication of the authors is not one of the clearest. I cannot render the description more intelligible than they themselves have made it; but still I think that, such as it is, it will not be read without interest.

M. Maréchal is the son and successor of a distinguished painter upon glass, and M. du Motay is a chemist known for useful labours. The results they have obtained gained the unanimous admiration of the Academy.

M. Léon Vidal, secretary and founder of the Photographic Society of Marseilles, has just published a volume entitled *Photographic Tables*. In it he has brought together ready-made calculations for the duration of the pose, which the operator has hitherto been obliged to seek for tentatively, and which long habit alone enables to determine with some degree of certainty; and these tables are accompanied by a very simple and ingenious photometer, by which the intensity of light in any place may at once be measured. It is something like a small pocket-book, the middle sheet of which is double, and forms a sort of little châssis. Into this is slipped a card, to which adheres a sheet of sensitive albumenized paper. One band only of this paper receives the light through a slit a centimetre broad, cut in the stiff card sheet, which serves as a shutter to the little châssis. Above this slit is a series of ten tones, obtained likewise upon albumenized paper and graduated from the tint produced by an exposure of one-tenth of a minute to that obtained in one minute. The photometric tables are calculated according to the length of time required by each of these shades for any focal distance up to 2½ metres, and for any diaphragm from 1 to 100 millimetres, taking as a basis the medium sensitiveness of dry tannin collodion. For wet collodion the pose must be eight times shorter.

The mode of using the photometer is as follows:—Suppose you are operating in the open air, and that the sun is shining on the spot where you are. You turn your back to the sun, open the photometer, and, holding it for a minute in your own shade on a level with your elbows, and at 25 centimetres' distance from your body, you seek which is the standard tone that most resembles the one you obtain. If you have any difficulty between two tones, you must choose the feebler one, as the development will always give you a good picture in such conditions.

Let us suppose that the tint obtained is No. 7, that the focus of operation is at 25 centimetres, and that the diaphragm of the objective is 3 millimetres across. Well, you open the volume at Table 7, seek No. 25 in the horizontal column at the top of the page, come down the vertical column till you reach the line corresponding to number 3 of the first vertical column, and there you see that with dry tannin collodion you must pose 24 minutes 32 seconds, and eight times less with damp collodion. In fact, you operate as with the multiplication table, the horizontal line containing the focal distances, and the vertical line the diameters of the diaphragms. M. Vidal likewise gives a table in which he appreciates the reflective power of the object which he wishes to reproduce, so that with his photometer and his tables nothing is easier than to determine the length of time necessary for posing, at least so near that if there be an error the developing liquid will correct it.

It is easy to understand what must have been M. Vidal's labour in the compiling of such a work. If the figures which he gives are found in practice not to be absolutely accurate, they will at any rate largely reduce the number of errors committed; and in this respect the photometric tables will render important services, especially to photographic tourists and amateurs. Ernest Lacan.

ARTIFICIAL LIGHT FOR PHOTOGRAPHY.

Sir,—As your correspondent "R. H. P." has quite misrepresented the purpose of my recent communication upon the Magnesium Light, perhaps you will kindly permit me to offer a few very brief observations in reply to his strictures.

I did not, then, assert, as he states in your Number of the 23rd June, that I got an image of the flame of a candle or gas-jet, simply because I turned a small slip of magnesium wire four feet from it, all ordinary flames being, it is well-known, more or less *actinic*; but what I particularly wished to draw attention to was the almost *instantaneous* action of some of these flames upon the collodion plate when under the influence of the burning magnesium—a second or two, in the case of the candle, sufficing to furnish a very strong negative. Neither did I say that the flame became actinic because it assumed a lurid reddish hue: on the contrary, I referred this appearance to an optical, and not a chemical cause, viz., "its own light being apparently extinguished partially by the more intense light of the burning metal."

Then, again, "R. H. P." objects to my hypothesis respecting the reflection, or emission (if he prefer the latter term) of the chemical rays by the solid particles of carbon existing in the flame; but, as the luminous radiations are so given out, and as flames poor in carbon have little luminosity, as well as, according to my own experiments, less actinism under the magnesium light, and also in themselves, than others rich in that element, it appeared to me fair to conclude that the light-giving and the chemical rays are alike sent forth by such particles, and in proportion to their number.

But "R. H. P." even doubts that the magnesium light has any action upon flame, although he will find that the vapour or "smoke" from a candle just blown out can be readily photographed by it, and knows, I presume, that the like hydro-carbon vapour exists in the interior of the flame.

"R. H. P." appears, too, to be ignorant of the fact that the luminosity of all flames depends upon the incandescent solid matter within them, and accordingly questions my assertion, that the brightness of the magnesium flame is occasioned by the floating particles of oxide in it.

However, the *brilliant* idea which he has conceived of "putting a pinch of magnesia in the candle-flame" may, if he will try the experiment for himself, serve to enlighten his darkness; at all events, if he will read Sir Humphrey Davy on Flame; Faraday's Chemistry of a Candle; or Daniell's Chemical Philosophy, he will find much on this and kindred subjects that will doubtless prove both "novel" and instructive.

Apologising for this intrusion, I am, very respectfully, sir, your obliged and most obedient servant,

W. H. Olley.

PANTASCOPIC CAMERA.

Sir,—In your note to my letter of the 23rd you express your fear "that it would be difficult to get plates of mica sufficiently perfect and sufficiently large" for the purposes of a "mica-plate pantascopic camera." That there would probably be such difficulty in procuring talc plates of anything like the size of what is known to photographers as a "whole plate" I do not for a moment doubt; but I should hardly expect much difficulty would be experienced in procuring them of the size of a "half-plate," as they may now be purchased of the "quarter size" at about two shillings or half-a-crown a-dozen, with all the required perfections; and I have on a few occasions seen them as much as ten inches in length. Even if mica-plates could not be procured of large size, still the instantaneous pictures produced on small plates by a lens of short focal length could (as has been shown) be enlarged three or four diameters with very fine effect.

But of course we are not confined to the use of mica-plates; any other material possessing the requisite flexibility and actinic transparency, if not acted upon by the photographic chemicals, would answer equally well, and one would be tempted to suppose that such a material could be prepared. As will at once be perceived, it is not indispensably necessary that the flexibility of the plates should be permanent, and, moreover, even transparency might be entirely done without, but in this case the film would have to be transferred to a glass or other transparent plate before intensification or printing could take place. The transference, however, could be easily effected. With many of the collodions now in the market it is only necessary to tear the film round the edge of the plate and let a stream of water run upon one side or corner to completely loosen the whole, which may then be transferred to glass in half a minute by bringing one of the hanging edges of the collodion on to the glass, and drawing out the original plate, whilst a stream of water runs down it.

The flexible, non-transparent plates might be made of japanned sheets of thin iron, india-rubber, gutta-percha, vulcanite, ebonite, or, perhaps, even of paper or card, made for the purpose or otherwise. The gutta-percha or india-rubber compounds, &c., might require a superficial coating of some varnish, to prevent them being acted upon by the ether and alcohol of the collodion; but even this I must question. Upon the whole I do not see any very great difficulties which would have to be surmounted in order to make a cheap flexible plate pantascopic camera.—Yours truly, X. Z. C. H. K. F. F.

Manchester, June 30.

[We know that large plates of mica, perfect enough for photography, can occasionally be obtained, but they are rare. It is, however, possible that demand may, as it often does, create supply. If our correspondent can give his suggestion a practical shape we shall be glad to hear further details.—Ed.]

Sir,—In your last number a correspondent with an eccentric signature of seven initials suggests the use of talc as a means of producing a cheap panoramic camera.

Your correspondent will find that the use of that substance in the specification of the patent granted to me and Mr. Harrison, for improvements in taking panoramic photographic pictures, is mentioned in that part of it which relates to our modes of rendering Martin's curved-plate camera applicable to the modern processes of photography.

The ordinary form of this camera, with its curved-plate holder and focussing-glass, is very expensive to construct. I have for some time been occupied upon a modification of it, by which much of this expense is avoided; but even then the lens must turn with delicacy and freedom upon a pivot, and if the fine atmospheric effects of the pantascopic camera be desired, the motion must be automatic, and a clock-work be adapted to the instrument. A revolving camera cannot, therefore, be ever sold at a very low rate. I hope shortly to introduce a camera in which the maximum of cheapness is attained; but the nature of talc, as you truly observe, will limit this form of the instrument to plates of very small dimensions.

With respect to the distortion of panoramic pictures when viewed flat, I would observe that if persons who entertain the views of your correspondent will call at the offices of the Pantascopic Company, 3, Red Lion Square, they may see a great number of views in which no distortion is perceptible, and in many of which the discrepancy between the curved and flat form is a positive advantage. It is only in a few limited cases, viz., those in which the chief objects (if architectural) are near and parallel to the plane of the picture when flat, that the distortion is "gross" and offensive, and even in these cases the distorted view may still be used by architects or artists to furnish the materials of a picture, for if mounted in the curved form, with the eye at the proper distance, a drawing may be made from it as correctly as from the objects themselves.

At an early meeting of the Photographic Society during next session I shall be prepared to show that in certain cases the distortion of a panoramic view, even when flat, is much less than that given by the modern large-angled view lenses. In a view taken by one of these lenses, the images of two similar objects at an equal distance from the lens are totally different in form and size, one having been formed by the central, the other by the oblique pencils of that lens.

Abundant materials for the criticism of the pantascopic views will shortly be supplied by every print-seller. I have furnished to Mr. Adolph Broun, of Dornach, ten pantascopic cameras, all, or the greater part of which are being actively employed upon Swiss scenery. A few of his earliest specimens have been sent to me, some of which have been declared by artists to be the most perfect views of nature ever produced.—I am, Sir, your obedient servant,

J. R. Johnson.

TO PREVENT MOUNTED PRINTS WARPING.

Dear Sir,—Displeased with the curl or warping of my cartes de visite, produced by the usual method of mounting, I was induced to reason on the cause of this, although unimportant, still unsightly appearance. I soon discovered that it must have been occasioned by the unequal expansion and subsequent contraction between the proofs and mounting cards, the former having been applied in a damp state to the dry mounts. The remedy appears so obvious that I have always thought the publication of such a trifle to be superfluous and unnecessary; until a casual circumstance lately occurred that led me to infer that others might have regretted the same defect, yet a too insignificant one to require the trouble of seeking a remedy, either from their own reasoning powers, or from the more general one of your always ready and obliging News' correspondent's page. Now, if not already guessed at, my plan of working shall be soon told, and will be found a much more effective one than the next best cure, a rolling machine. Lay a wetted piece of thick blotting-paper between each mount a few minutes previous to the commencement of mounting operations. Having applied the adhesive substance, either starch-paste or solution of best glue, to the back of the photograph, make the mount surface-dry with blot-paper, and carefully place it on the mounting card; press out the surplus paste by the help of a square and straight-edged board, and, lastly, putting it between dry and thick blot-boards, the work is completed. I need scarcely add that the mounted proofs will require to have blot-papers and a weighted board placed on them, and be changed occasionally until quite dry.

Should the above drop in the ocean of onward progress have been already published in either of the useful little photographic manuals of the day, or in the more useful periodicals; or should your better judgment deem it not worth the space it will necessarily occupy in your ever increasingly rich mine of photographic information, be pleased to consign it, without scruple, to its more fitting place, the waste-basket.

Thanking you individually for your liberal and untrammeled gift of the collodio-chloride process, and trusting to your chemical skill and untiring perseverance for still further perfecting, its present very promising qualities—Believe me, dear sir, yours very truly, HENRY H. HELE.

Teignmouth June 3rd, 1865.

ON PORTRAIT BACKGROUNDS.

Sir,—Your very intelligent contributor, "J. S. W." writes much that is substantially true, but I should like to make some few comments upon some of his remarks which I consider less reliable than others.

I think if he favours Mr. Wall's paper with a more careful perusal, he will find the journals are not said to have entirely ignored the subject of art in connection with photography, but only that they have entirely ignored the higher reachings of artistic teaching; that they have recognized no branch of that subject but the technical. The aim of that paper, as I understand it, was to urge upon journalists and members of societies the importance of striving to elevate the taste as well as to educate the judgment. I know "J. S. W." personally, and am sure that if he reads Mr. Wall's paper in this light, he will not find it so "vague" as those who have misunderstood its intention imagine it to be. Posing, lighting, grouping, and composing are no more the be-all and the end-all in artistic photography than they are in other branches of pictorial art. The poverty of design, and absence of taste and feeling which glares out from ninety and nine of every hundred otherwise good photographs, prove Mr. Wall's remarks to be no more "sweeping" than in justice they could be, and in earnestness they should be. "J. S. W." says he has read in three years' volumes of the NEWS many papers on art in connection with photography; forgetting that, so far from denying this, Mr. Wall said much the same thing in these words: "It is true that the editors of the two principal photographic serials occasionally place before their readers short technical papers on artistic questions," &c. (see page 282).

In the next place, I think "J. S. W." is wrong in blaming the producers of tasteless backgrounds, instead of their purchasers. The very bookcase and chimney-place, the incongruously over-ornamented dadoes and davenports he mentions are to be found, on the average, in nearly every other photograph, and the demand for such things has been so extensive as to prove more urgently than three score such papers as Mr. Wall's could do, the real necessity there is for improved taste on the part of photographers. "J. S.W." will hardly assert that photographers could not find pieces of furniture of a more artistic description if they had sought for them; or that artists who can produce really artistic backgrounds are not willing to be so employed if photographers desire such productions. The present race of background manufacturers spring into existence to meet a demand, not to create one; and what kind of artists (?) do they, as a rule, employ? The very worst of country scene-painters, the refuse painters of the little country theatres, the scenery of which has long been a standing joke. Do I blame the manufacturers for employing such men? Certainly not—the prices paid by photographers will not permit the employment of either artist-decorators or true scenic painters. Does "J. S. W." know that the very background he so justly praises—that behind Lake Price's portrait of Lord Elcho—and which was painted, as he says, by the late J. O. Harding, produced nothing but whispered ridicule when put up for sale amongst the assembled photographers, and did not find a purchaser?

Yet a little more space, an' it please you, Mr. Editor. Lawrence was a great painter, but he belonged to a school in which the conventional and false rode dominant over better and higher qualities, and I cannot subscribe to "J. S. W.'s" dictum, when he recommends a stormy sunset sky as a suitable background to a face and figure illumined with diffused daylight.

In conclusion, permit me to state, in reference to the "leader" on "J. S. W.'s" paper, that Mr. Robinson does not execute *all* his "charming" backgrounds himself, inasmuch as two of the backgrounds you held up as shining examples in your review of the Photographic Exhibition, were executed from designs furnished by myself and painters employed by yours, &c.,

A BACKGROUND MANUFACTURER.

[In all matters of art, we hold it the duty of producers to form public taste, and not simply to meet a demand by supply. The demand which suddenly came into existence with the rage for card pictures was simply for pictorial backgrounds. If good designs had been furnished, they would have found purchasers as readily as bad ones; and good designs, so far as the mechanical process is concerned, are as easily multiplied as bad ones. We suspect, however, as he recently stated, that the old miniature painters are responsible for much of the bad style which has prevailed. Regarding Mr. Robinson's backgrounds, we said that "one or two" had been "charming." We especially referred to one consisting of the opening into an arbour, with a fine effect of light glancing past; and to another with trees overhanging a piece of water, with a fine quiet distribution of light and shade. These two we know Mr. Robinson painted himself, and have heard him complain bitterly of those things he had to buy when he had not time to paint for himself.—ED.]

Talk in the Studio.

SOUTH LONDON OUT-DOOR MEETINGS.—The first meeting of the session was held on Saturday last; but few comparatively of the members met at the trysting-place at Beckenham. A select number of them assembled, however, in the evening at the house of the President of the Society, the Rev. F. F. Statham, M.A., F.G.S., where they were gracefully and hospitably entertained, and spent a very delightful evening.

PHOTOGRAPHS OF BRITISH SCENERY.—Mr. C. T. Newcombe has just opened at his establishment in Fenchurch Street an exhibition of photographs of British scenery, consisting of nearly three hundred whole-plate views. The first impression which occurs to us is the admirable judgment displayed in the selection from just those parts of England which furnish at once the best subjects pictorially, and those rich in historic and associative interests. There is a large collection from Wales; an admirable selection from the Isle of Wight; Warwickshire, full of scenes of natural beauty and historic associations, furnishes a large number; Tintern, Netley, Chepstow, Raglan, Pembroke, Ludlow, and other classic names, each furnish many pictures; London, Windsor, Eton, Harrow, and various other places are also represented. It would be invidious out of so many to make special mention of individual pictures; but we may mention one noteworthy fact, that those subjects involving the greatest photographic or pictorial difficulties are always those in which Mr. Newcombe has been the most successful in securing perfect results. In some of the pictures very happy disposition of figures adds much to the value of the results; we may especially mention two of Vale Crucis Abbey, Nos. 257 and 258, as excellent in this respect. One of the most charming pictures is No. 69—The Mill, Guy's Cliff, Warwickshire, which vividly recalls one of the most charming spots we know. A large number of the subjects are also reproduced in smaller size, which will no doubt suit many better than the larger pictures.

The Fire at Messrs. Sotheby, Wilkinson, and Hodge.—We are happy to state that the more valuable portion of the late Mr. Bath's photographic apparatus, &c., announced for sale by auction in our last week's advertising columns, has been preserved from destruction, the valuable collection of lenses, magic-lantern slides, &c., luckily having been at the premises of Mr. Highley, of Green Street, Leicester Square (who had the arrangements of this sale) at the time the fire worked such destruction to other valuable properties awaiting sale. The library, however, has received serious injury by water, and Mr. Highley himself has had a valuable collection of scientific books destroyed. The sale of the apparatus will come off on the day originally fixed, but will take place at the Gallery, 21, Wellington Street, instead of at the old rooms.

The Photographer in the Hands of Brigands.—We regret to learn that there is little hope of the early release of Mr. Moens from the hands of brigands. The sum of £10,000 demanded as ransom would doubtless be raised; but it appears that no certainty exists that release would follow payment. The money is to be paid into the hands of an agent before Mr. Moens can be released; and it is not improbable that if the demand were complied with, a fresh demand would be made. A sum of £3,000 has already been paid into the hands of this agent, by whom it appears a commission, amounting to about three-fourths of the entire sum, is kept for himself.

Obituary.—We regret to announce the recent death of Mr. T. G. Mackinlay, one of the earliest photographers, who for many years occupied a seat at the council of the Photographic Society. Some of the earliest and finest portraits ever produced by the calotype process were taken by Mr. Mackinlay, who, as an amateur, excelled in this branch of the art. He was well known to and highly respected by the early photographers, and by the members of many learned societies and clubs of which he was a member.

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To Correspondents.

H. C.—Some of the pictures now sent are a great improvement on the last. The old gentleman and the two little girls without hats are good. It is very difficult in such a room as you describe to get the best results, but it is clear that by care and attention to the management of the light you may get some approximation to good results. Your side light should commence one or two feet in front of the sitter. With such a light as yours, be careful not to under-expose nor over-develop. Mr. Robinson's address is Winwood House, 68, Canonbury Park South. We cannot tell you anything about his terms for tuition. Write to him, and inquire. The cost of registration, if done through our publisher, is 1s. 3d. for each picture. It entirely depends upon whether the engraving in question is copyright, which in all probability it is. You had better get permission of the owner or publisher of the engraving.

H. W. T.—Your design would be improved by extending the side light at least 5 feet further front, and the top light also. With your present arrangement a considerable amount of light must be shut off by blinds frequently, and this will limit the quantity of available light very considerably. 2. We do not know of such an opportunity as you desire, but have handed advertisement and post office order to our advertising agent.

John Stewart.—The ordinary gaslight may be made somewhat brighter by the process of naphthalizing, which consists in making it pass through a vessel containing naphtha, and so take up a portion of the naphtha vapour; but the best light for the magic-lantern is the oxyhydrogen, in which you may use the common coal-gas in conjunction with oxygen.

G. R. B.—The second print of the lady is immeasurably superior to the other, and shows the advantage of the reflector. No. I is a direct top front and light, which we consider very bad. Your picture after Hogarth's "Politician" is very good; so also is the "Tired Soldier." We shall be glad to see the larger one. It is probable that a stronger bath of new hypo would prevent the spots, which certainly have the appearance of under-fixation.

Gulielmus.—The chief defect is in your negatives. It is impossible to get a good print from a bad negative. Your negatives are all under-exposed. With a better negative and considerably deeper printing, we apprehend that you would find no difficulty in obtaining black or purple tones. 2. The prints are all very bad. 3. Yes, toned and fixed in the dark, or at least in subdued light. Much depends on circumstances. For many months in a dry place.

J. Jackson.—For enlargement a triple is undoubtedly the best lens you can use. The No. I will especially well suit your purpose.

W. H. W. Ross.—We will bear your wishes in mind.

M. H. R.—If you print your transparencies by superposition you must either use three glasses in fitting them up, have the picture reversed, or print on the ground-glass. If you use camera printing you may, by reversing the side of the negative next the lens, print the picture so that it may be mounted inside, and so make two glasses serve a ground-glass and that on which the print is, but with the back of the glass mounted outward. You will find a description of camera printing by wet collodion by Mr. Blanchard in our Year-Book for 1864.

Vigormenses.—Thanks for the extraordinary specimen of puffing, which we shall make use of.

M.—We fear that the results which you ascribe to over-exposure are really due to over-development and under-exposure. Try at least double the exposure; you will then secure detail in foliage; be careful not to over-develop, employing plenty of acetic acid in the developer, and you will not risk the loss of the distance or cause it to merge into the sky. It is over-development that generally causes such a result. It is possible to develop, dry, and then subsequently intensify, but it involves many risks. For dry plates it is safer to employ a saturated solution of hypo for fixation, as there is no risk, however long it may be applied, of the detail in the image being attacked, which is easily done by cyanide.

F. Deane.—We do not know of any one who supplies the solution of nitro-glucose ready for use at present. It is possible that when the process comes into use this may be done; but any manufacturing chemists, such as Hopkin and Williams, would prepare it for you.

A Subscriber (Paris).—Mr. Sayce does not especially mention the keeping qualities of his preparation. Collodio-chloride of silver keeps perfectly for months, and we should think that collodio-bromide of silver will do so. Perhaps Mr. Sayce will kindly say.

Wandsworth.—A collodion which adheres well to the plate is generally best secured by the use of pyroxyline made at a high temperature, somewhat powdery, and by the use of an alkaline iodide.

Medicus.—The examination to which you refer was made by Mr. Spiller, and the details appeared in our pages. Theoretically it is probable that the result will take place in photographs, but the material is present in such infinitesimally small proportions that we should not anticipate any appreciably evil results. Our own experience with the paper has been favourable. Thanks for your other communication. We quite agree with you.

Amateur.—There are many modes of applying ventilating facilities to a tent; but much depends on its construction as to the best mode. It is a good plan to have a window which is readily opened the moment white light may be admitted. It is desirable, however, to have some inlet for fresh air even when light is excluded. As light never travels round a corner, it is not difficult to make an aperture, covered again with a piece of cloth, which will leave lateral apertures for air, without readily admitting light.

Nelson K. Cherrill.—We forwarded the communication.

Jacques.—The defect you describe is that we have several times referred to as "a red deposit in intensifying," and you will find the remedies indicated sufficient. 2. The second defect is one which occasionally occurs in coliodion iodized chiefly with potassium, especially if the collodion contain very little bromide, but it is also at times the fault of the bath, and sometimes of an imperfect sample of glass. 3. The wavelike mark we should think due to the irregular flow of the developer over the film, on its first application; and wherever it stops a mark will be the result. 4. We do not know of any purpose for which, in our estimation, the globe lens is superior to the triple. 5. We do not know the gentleman or process to which you refer. Do you mean Dr. Jacobson, who has prepared aniline colours for photographers?

B. J. Edwards.—The letter was forwarded.

J. P. C.—When you send the portrait lens of one maker to have a third lens added, to make it a triple, by another maker, you risk getting an unsatisfactory result. If it work so imperfectly as you describe, the best plan for you is to send back to the last maker at once, and not attempt to tamper with it yourself. It is easy to ascertain whether the visual and chemical foci coincide. If you know that your camera is true, and after focussing carefully and getting a sharp image on the ground glass, you find the picture taken is not sharp (without having moved), you may conclude that the chemical and visual foci are not coincident.

J. Arkwright.—Your top light is too directly vertical, and all your light is too near the sitter, producing an abrupt effect. The addition of four or six feet of glass at side and top on the north side will probably give you a great advantage. Use reflectors to light up the shadowed side when too dark. By proper arrangement, good results may, we think, be obtained by retaining the studio in its present position.

Errata.—In Mr. Sayce's article on the Collodio-bromide of Silver Process, for glasses "nipped" at the edges read "tipped" at the edges; and for hot water "over" read hot water "oven," in reference to the drying-box. In Mr. Werge's article, "To Dublin and Back," 32nd line from commencement, for "such warm skies and middle distances," read "such warm skies and cold middle distances." In Mr. Pettitt's letter on Photo-Binographs, which appeared on the 23rd, the following corrections are necessary:—16th line from top, for "lower subject" read "Louvre subject;" 45th line from top, for "a binocular vision," leave the "a" out; 48th line from top, for "this function" read "this junction."

Several Articles standing over, and Correspondents in our next.

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Photographs Registered during the Past Week.

Cramb, Bros., West Nile Street, Glasgow,
Photograph of a Lady.
Group of Eight Portraits.
Mr. John Stuart, Glasgow,
Three Portraits of Rev. James Wells.
Mr. John Pusey, Coolhurst, Horsham, Surrey,
Photograph of Joan of Arc (from a water-colour drawing by Lady Marian Alford).
Mr. John Beattie, Strathearn House, Clifton,
Two Portraits of the Prince of Wales.
One Portrait of Prince Albert Victor.
Mr. Frederick Snary, 26, Castle Street, Bristol,
Portrait of Rev. William Rose.
Mr. James Burke, 12a, Nassau Street, Dublin,
Portrait of Hon. Charles Gavan Duffy.
J. Bullock & Sons, Macclesfield,
Two Photographs of a Gentleman.
Mr. Thos. Birtles, Milton Street, Northwich,
Photograph of Thos. Stringer, Esq.
Mr. J. Groom, Shrewsbury,
Photograph of Group of Preachers, Trustees, &c., to St. John's Chapel, Shrewsbury.
Messrs. J. & E. Owen, Newtown, North Wales,
Two Photographs of Rosanna D. Fray.

THE PHOTOGRAPHIC NEWS.

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PHOTOGRAPHIC PORTRAITURE: ITS POSITION AND PROSPECTS.

There is a prevalent feeling amongst many professional photographers that the demand for portraiture is on the decline, and the profession of the portraitist in a state of decadence. We remember that a similar impression prevailed with many of the higher class of portraitists when the demand for Daguerreotype began to be destroyed by the prevalence of cheap glass positives. The market was rapidly inundated with common, dingy-looking portraits, then contemptuously termed "shilling positives." These were doubtless in some instances produced by respectable men, but in many cases they were taken in dens where assault, robbery, and other crimes were occasionally heard of. It was believed by many that the prevalence of this kind of trade would almost destroy photographic portraiture; that the public would become disgusted alike with the productions and the producers, and that the art would become a byword. Respectable portraiture did for a time languish. We know one able portraitist who, having for some time been clearing upwards of a thousand pounds sterling annually in taking Daguerreotypes in the provinces, opened an establishment in London just as the tide was turning, and in the first two years lost two thousand pounds.

A new phase of portraiture, however, suddenly sprang into popularity. The *Carte-de-Visite* was introduced, and a rage for the new portrait ensued such as has no parallel in pictorial annals. Everybody kept an album, and exchanged portraits with everybody else. Members of the family, personal friends, and speaking acquaintances were soon exhausted, and then the rage for portraits of public characters set in, and emperors and murderers, princes and prize-fighters, bishops and ballet-girls jostled each other in the miniature picture galleries; enterprising and skilful portraitists made reputations and fortunes; and many honest but misguided persons left the farm and the merchandise to enter a profession for which they were little fitted, tempted by the appearance of facile gains which photography possessed. This kind of thing could scarcely be expected to last. It has had a longer tenure of public favour than many anticipated for it already. For nearly four years the demand appeared steadily to increase, but now, according to the opinion of many, the tide has turned, and is ebbing rapidly.

The question: "Is there an actual decline in the demand for photographic portraiture?" is naturally an interesting one to all interested in the art, and is worth a few minutes' consideration? We have taken some pains to obtain opinions and evidence on the subject from a variety of trustworthy sources. We hear first, from some dealers, that there is a decided dullness in all branches of photographic trading; we hear from many individual portraitists that they have experienced a great declension in business, and we hear of many photographic establishments to be sold or let. All these things tend to prove the gloomy side of the question; but then, on the other hand, we have evidence quite as trustworthy which goes far to neutralize this gloomy argument. The acting partner in one of the largest photographic publishing houses in the world, says the great rage for card-portraits has subsided, but the demand for public card-portraits and albums to contain them is steadily established as a permanent branch of fancy trade. The principal of an establishment which sends out the greater portion of the glass upon which photographic negatives are taken, declares the demand for such glass to be as great as ever; and that whilst many portrait establishments feel a decline in their business, it arises rather from the fact that so many persons have gone into the profession, and thus divide the patronage; that established portraitists suffer, not because there is less demand for portraiture, but because there are more persons to supply the demand, which, in the aggregate, is now as great as ever it was. And we know a few first-rate establishments, depending rather on connexion than on promiscuous patronage, who are now nearly as busy as they have ever been.

The legitimate deduction from the varied evidence probably is, that whilst the card trade is probably somewhat on the wane, it will never die out; and that many portraitists are now suffering a little from the over-competition induced by the sudden flush of success which overspread the profession a year or two ago. Under such circumstances, the profession will undergo a natural process of sifting; the weakest and least competent will return to other walks of life, which they are, possibly, better fitted to adorn, and the stronger and more competent will, on Darwin's theory of "natural selection," remain, becoming more vigorous and flourishing.

It is tolerably clear that the demand for photographic portraiture can never subside or decline. So long as human affections, on the one hand, and human vanity on the other, exist, so long will the demands for portraits exist. So long as there are birthdays, and partings, and betrothals, and marriages, so long will the portrait be naturally associated with the most valued gifts, *souvenirs* of these occasions. So long, on the other hand, as there are changes of fashion, new dresses, and new uniforms, and new modes of arranging the hair, and newly-grown moustachios and whiskers, so long will vanity or caprice desire to preserve a record of these important matters, and so long will photographic portraits be the naturally chosen record in question.

The profession may, then, change its phases, and its fortunes may, within certain limits, ebb and flow, but there is no ground for apprehension that it will to any serious extent decline or cease to be remunerative. The natural question is, then, as to what phase will most likely take the public mind next. That is very difficult to state; but we think it is very probable that for the present there will be no especial rage, but rather a steady demand for miscellaneous portraiture, in which those who excel most in the production of tempting specialities will probably succeed best. It is probable that a steady demand for card portraits will continue, but to nothing like the extent which has prevailed during the last two or three years. It is probable that a taste for coloured work will, to some extent, revive, if it can be done well and at moderate rates. Life-size portraits, or enlargements generally, can never, we think, come into very great demand, as without careful retouching or colouring they are, for the most part, exceedingly unsatisfactory, and sometimes hideous. A life-size monochrome is like no style of art. A little skilful touching in crayons may give them all the general character of the once favourite chalk heads of Sir Thomas Lawrence, and it is probable that those artists who produce the most effectively touched, tinted, or coloured enlargements, at moderate, but not low prices, will command a connection for such work.

It is probable that amongst the novelties which will please the public taste, portraits on opal glass will become leading favourites. The exquisite purity, delicacy, and force of these pictures possess great charms in the public eye, which will render them pre-eminently suitable for gifts. The simplicity of the process of production when our collodio-chloride process is used is greater than that of any other photographic process, no operation of exciting or development being necessary. The very beautiful examples by Mr. Mayall, exhibited at the last meeting of the Photographic Society, were striking illustrations of the rapidity and simplicity of production, the negative and several of the charming examples exhibited having been produced without difficulty in the same day. The toning and fixing are very rapidly effected, and the amount of washing is not longer than that given to a negative. By this simplicity of production it becomes easy to produce the pictures at a moderate cost, whilst their extreme beauty will always secure for them readily a good price from the public. They will, moreover, readily admit very beautiful effects in colouring, either by means of water or powder colours. A method of colouring similar prints at the back, and then transferring them from the glass to paper, which gives very fine effects with comparatively slight labour, will also be found valuable; we shall describe it in the course of a week or two.

Printing on opal glass by development presents greater difficulties, but, when mastered, produces very excellent effects, and, with camera printing, has the advantage of permitting enlargement or reduction in the print from the same negative.

It is tolerably clear, we think, that if, even amongst general portraitists, the card mania is on the wane, there will always be a steady demand for good portraiture; and those portraitists who excel in the most charming specialities will command the best connection. It will suit the taste of some to cultivate the production of enlargements, others of coloured miniatures, others of cameo portraits, and others of opal pictures; and those establishments which excel in all will necessarily take the *pas* of their less enterprising brethren.

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Jottings for 1865.—No. 4.

BY A PHOTOGRAPHER'S ASSISTANT.

Photography *versus* Fine Art.

Mr Mudd merits the thanks of photographers for his singularly able satire on the present (although treated as the future) state of photography; for however prejudiced we may be in favour of the art we practise and love, we cannot close our eyes to the fact that efforts have in most instances been exercised in a wrong direction to secure for photography the coveted recognition as a fine art.

The gentleman before-named has humorously called attention to the almost total absence of subjects bearing on art-culture in the periodical discussions and proceedings of the various societies, and we are glad to find that, following in the same track, Mr. Wall has brought his pen to bear on the feeble fortress of self-complacency that has so long sheltered us from the shafts of criticism; and now the fact is clearly shown that glaring defects still mar the artistic qualities of photographic productions. The sweeping censures contained in his paper are doubtless too generalized, still we cannot but admit that when more than ordinarily high qualities are noticed in a picture, the process and details of manipulation by which it was produced become the subject of earnest inquiry, to the entire exclusion of thought being directed to the higher qualifications possessed by the artist whose productions bear evidence that

> "Art is cautiously concealed
> Beneath those beauties that reveal
> A perfect whole."

Taking all things into consideration, we can scarcely wonder why this state of things continues to exist, because photography, being comparatively a new art, has, by its profitable popularity, enticed into its practice numberless labourers whose tastes, former occupation, and habits are not congenial with the requirements that bring artistic excellence within immediate reach. Art is therefore ignored, and manipulative skill is deemed the main desideratum, thus reducing photographic art to a mechanical pursuit. Fortunate is it that men of mind and skill such as Mudd, Bedford, Robinson, Wilson, and others, have put their shoulder to the wheel, for by their efforts we may hope to see the art successfully stem the tide of present degradation, and presently turn into the clear stream of intelligent progress, where the attainment of manipulative skill will be followed by earnest inquiries for art-knowledge, and art-knowledge applied to practice will secure results worthy of pursuit.

Attempts have, from time to time, been made through the medium of the various photographic publications to bring before us matter treating on art principles; but to our mind it appears the subject hitherto has not been treated in a style sufficiently clear and comprehensive to meet the requirements of photographers; the series of articles written by Lake Price, Esq., some half-a-dozen years ago, are rich in vigorous thought and skilful treatment, but they meet the painter's wants rather than the photographer's, because the subjects there analysed, in most instances, soar far above anything that photography can aspire to. The same rules might of course be brought to bear on its productions; but even as a child has to plod through the mystical characters called the alphabet, so do the majority of photographers need the simplest rudiments of art-knowledge placed before them stripped of high-sounding terms and illustrated by familiar examples, not such as are borrowed from the old masters, but selected to meet the every-day wants of their own practice. Instance perfectly arranged carte de visite, and other forms of portraiture, placed in juxta-position with others where art rules have been defied. The defects in simple language should be explained and remedies suggested. Thus, by introducing a series of progressive illustrated lessons the student will, by an easy road, be brought to see his own defects and to understand what is meant by the æsthetics of pictorial art.

We incline to the belief that artists who favour us with art lessons too frequently forget the limits that prevent the application of æsthetics in its broadest sense to photographic practice. Accepted as defining the philosophy of taste in the ordinary meaning of the term, æsthetics certainly approach to, and should form part of, our art; but when we soar away to the realms of ideality and refined sentiment, we find, alas! too often our art waits on us no longer, except, indeed, we seek those hidden nooks where nature's hand has traced the perfect picture. Calm repose or giant warfare might sometimes there be found, but at home, in the studio, starched dandies, grumbling dowagers, and crinolined misses form the models. Poetry, sentiment, flowing line of beauty—rubbish! they must be immortalized after their own peculiar fashion, so make haste, for other customers are waiting, and the only thought here required is, to talk the sitter into a good humour, and quietly carry out, so far as practicable, the minor rules of art, for should you here attempt high art, 'twould bring the thought-sublime within the scornful reach of the ludicrous.

When the rare privilege is our own to view the exquisite productions of a Robinson or Rejlander, we cannot avoid the thought suggesting how transcendently more beautiful must be the conceptions as they exist in the cultivated imagination of their authors. What anxious pains expended in vain attempts to instil in other minds a realization of vivid scenes that struggle in their own! And, after all, how feeble the results compared with the glowing mental pictures that need less stubborn soil to give them perfect growth! And we think we hear the artist exclaim, "Oh! for the obedient clay or ready brush, for nature, when endowed with life, is stiff, and too unwieldly to meet the poet's fancy, whose world is soul-moved action, or soft, calm, musical repose.

Photography, indeed, has earned a niche in art's temple, because, within reasonable limits, the display of taste is not beyond its reach, and, under like conditions, sentiment, in its proudest phase, is within the range of possibility, but he is no friend to his art who would profess it capable of portraying scenes of which the poet writes and dreams.

Photography might aim high as an effectual aid to science. It may, indeed, be styled a popular educator, bringing before us scenes that belong to foreign lands; transcribing faithfully the time-defaced ruins of once flourishing cities, or showing with fidelity the busy hands of civilization. It can bring down from on high a true image of the starry firmament, or pierce through the mysteries of the gloomy stone-bound chambers in Eastern pyramids. It can reproduce remains of mammoth extinct races, or its powers can bring the tiny inmate of a leaf-stem to a size that admits of unassisted visual examination. In short, where nature within reach is found, photographic art can grasp it, and when controlled by refined taste, where taste may be displayed, it follows up the master will. As a means of reproduction, it stands unrivalled; but when it trespasses on the domain of ideal art, it stammers oft, and cannot speak the story. We should therefore look the matter boldly in the face, examine the capabilities of the art, and, after laying a boundary-line, endeavour to raise each point to its highest standard of excellence, so that, whether regarded as a science or art, it may be capable of offering effectual resistance to adverse criticism. We have here treated on photography as an art; in our next we shall endeavour to describe its shortcomings when viewed as a science. A sincere lover of truth, we deal here with wholesome truths, and although pictorial composition lies beyond the branch we daily practise, still our mind does ofttimes outstrip time in dreams that show a reached perfection in the art men name Photography.

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ON JAPANNING AND MOUNTING PAPER PHOTOGRAPHS, OR THE TRANSFERS ON AMERICAN CLOTH, TO JAPAN GROUNDS, &c., &c.

BY A PRACTICAL MAN.

The art of ornamenting, painting, gilding, and varnishing, after the manner of the native artists of Japan and China, with a view to preserve and beautify articles made of wood and metal, also those of paper, leather, and cloth, may be made available in conjunction with photographs. The articles most in request, and generally selected for japanning, are pieces of household furniture, cabinets, screens, work-boxes, writing-desks, work-tables, trays, &c., &c., and all articles that it may be desired to preserve from moisture, for which purpose it is well adapted, as it dries exceedingly hard, and is impervious to water at all moderate temperatures. It may also be employed on any dry substance, sufficiently inflexible to prevent the coating from cracking or peeling off. The true japan procured from the native artists is a varnish or lacquer peculiar to itself, and occasionally brought over to this country, but, from its poisonous qualities, and the consequent risk and danger to the persons using it, is seldom employed. It is the juice of a tree, and is collected by making an incision in the trunk, and placing vessels underneath to receive it. It has the appearance of cream when it first runs from the tree, but on exposure to the air becomes of a dense black. It is prepared for use by submitting it to the action of the open air in shallow vessels prepared for the purpose. It is kept constantly stirred, so that the action of the air may impart to it a uniform tone; it is then mixed with a fine powder of well-charred wood, when it becomes fit for use. It is spread thinly and evenly over the surface to be ornamented, and dried in the sun. When hard, it is rubbed and polished with a flat smooth stone and water until it becomes like a sheet of plate glass, and is ready to receive the gold or silver leaf, or any other ornamentation that the skill of the native artist may think proper to adopt and employ: this is the native method. The method and manner about to be described differs from it considerably; it is, perhaps, less durable, but it is not injurious to health. In some cases a *priming* or undercoat is employed to fill up any inequalities, and make smooth the surface to be japanned; but when the original surface is perfectly smooth, as in the case of metals and very hard, close-grained, smooth wood, the *priming* or *undercoat* is omitted, and the coloured varnish or proper japan ground immediately applied. The advantage of the priming or undercoat is that it fills up all uneven roughness in the surfaces, and makes it easy, by rubbing and water polishing, to procure a smooth and glass-like face; it has, however, the inconvenience, and is liable to get cracked and peeled off if exposed to any violence, a danger that those bodies japanned in the same way, but without the priming, are not exposed to.

The priming or undercoat is a composition of strong glue, size, and whiting, mixed to such a consistence or body as to hide the face or surface of whatever it is laid upon. This is for large and coarse work; when needed for the finer kinds it is better to employ parchment size, mixed with about a fourth part of isinglass, and using, in lieu of common whiting, *Paris white*, or *flake white*, it is not so liable to peel or crack; and the surface to which it is to be applied should be prepared for this priming, by being well cleaned and brushed over with some hot parchment size, diluted with two-thirds of water, or any proportion according to its strength. The priming should then be laid on as evenly as possible with a brush, and left to dry. If the surface on which this priming is laid be tolerably even, two coats applied in the manner described will be sufficient; but if, on trial with a wet sponge, it will not receive a proper water polish on account of inequalities insufficiently filled up, further coats must be given to it, taking care that, previous to the last one being laid on, the surface is smoothed off by rubbing over with Dutch rushes, or very fine glass-paper. When thoroughly dry, a water polish should be given to it, by passing over every part with a soft sponge, moistened with water, till the whole appears perfectly smooth, plain, and even; the work will then be completed and ready to receive the ornamenting, whether in gilding, silvering, bronzing, or with paper photographs, cut to any required shape or form, and fastened by strong paste or glue to the tops or sides of boxes, tables, desks, or cabinets. If the photographic proofs are to be slightly tinted with oil or water-colour, they must be coated with the following composition, or size laid on when cold with a flat brush:—2 ounces of Salisbury or other fine glue, and 2 ounces of white curd soap, are to be dissolved in a pint and a-half of hot soft water, to which must be added in powder 1 ounce of alum; when cold, strain through a piece of fine muslin into a wide-mouthed bottle for use. If the photograph is to appear plain, it will only be necessary, after fastening it in its place, to give it two or three careful coats of gelatine size; it will then be ready when dry to receive the varnish, which is usually composed of coarse seed lac and resin, of each 1 ounce, alcohol half a-pint; when the lac and resin are thoroughly dissolved, strain off. This varnish, in common with all made from alcohol, must be laid on in a warm place; the articles also must be thoroughly dry and warm, as all dampness, cold, or moisture chills a spirit varnish, and prevents its taking a proper hold of the subject on which it is laid. A japan ground may be formed by rubbing up any desired pigment with shellac varnish. The pigments for simple or compound colours must be ground very fine and smooth in spirits of turpentine, then mixed with the varnish, and spread evenly and carefully over the work with a flat camel-hair brush.

Forming a perfectly *white and hard japan ground* is attended with some difficulty, as there are no substances that can be dissolved so as to form a very *hard* varnish but what have too much colour, and consequently lower the whiteness. However, the nearest approach to the desired end is by employing the following white varnish or composition:—Take flake white or white lead, with one-sixth of its weight of starch, and when dried, temper it properly for spreading with a varnish prepared as follows:—2½ ounces of mastic in fine powder put into a wide-mouthed bottle, with half a-pint of turpentine; let the gum dissolve in a gentle heat, and strain it clear from sediment through flannel; lay this on the body to be japanned, either with or without the priming, as above directed, and then, when dry, give it five or six coats of the following:—from any quantity of the best *seed lac* pick out all the clearest and whitest grains; 1 ounce of these, 1½ ounce of gum animi, reduced to a coarse powder, and dissolved in one pint of alcohol, the whole to be strained clear for use, each coat to get dry before the second application.

A Blue Japan Ground may be formed of a bright prussian blue, glazed over with smalt. As this, if mixed with the *shellac* varnish, will have a yellow tinge, where a very bright blue is required the method directed in the case of white grounds must be pursued.

A Scarlet Ground.—Vermilion may be used, and the effect much improved by glazing it over with carmine or fine lake. If, however, the highest degree of brightness be required, the white varnish must be used.

For Bright Yellow Grounds, king's yellow may be used, and the effect considerably improved by dissolving powdered turmeric root in the alcohol of which the upper or polishing coat is made. The turmeric mixture must be strained clear from the dregs before the seed lac is added to form the varnish, the seed lac varnish not being injurious here, as in the case of some other colours, because, being tinged with a reddish yellow, it adds force to the colours.

Green Grounds are produced by mixing prussian blue, or distilled verdegris, with king's yellow; and the effect will be much heightened and extremely brilliant by laying them on a ground of gold leaf, and may be used with the seed lac varnish, as the same reasons that apply to the bright yellow grounds are also applicable here.

An Orange-coloured Ground may be formed by mixing vermilion or red lead with king's yellow, or orange lake; or red orpiment will make a brighter orange ground than can be produced by any mixture.

Purple Grounds may be produced by the mixture of lake or vermilion with prussian blue, and treated as the rest with respect to the varnish.

Black Grounds may be formed of either ivory black or lamp-black ground very fine, and laid on with the *shell* lac varnish; the upper or polishing coat of *seed* lac varnish. Common black japan grounds are given to *metal* by means of heat. The work to be japanned must be coated over with drying oil, and, when moderately dry, put into a stove of such heat as will change the oil to a black, without burning it; the stove should not be too hot when the work is put in, nor should the heat be increased too fast, either of which acts would make it blister. The slower the heat is augmented, and the longer it is continued within reason, the harder will be the coat of japan. This kind of japan requires no polish, having received, when properly managed, a sufficient one from the heat. A *simple black japan* for tin, the insides of tubes, &c., &c., may be made by mixing japan gold size, with fine ivory or lamp-black; this will dry out with a good gloss, and requires no varnishing afterwards. The common black japan sold by the tinmen and ironmongers is a serviceable composition, and can be procured at a trifling cost, and at a moment's notice; this, laid on with a soft brush in a dry place, will answer very well for many articles; in fact, direct positives backed up with the same, on a coat of hard varnish, have been found to be perfectly sound and free from cracks after a lapse of seven or eight years. All blacks are much improved in tone by the admixture of a little blue and lake, to give a slight purple cast.

In the painting of japan work, the colours should be tempered and rubbed up in varnish, so that all the pigments and solid colours may be used, as they are thoroughly secured by it, and run no danger of changing or flying. The preparation of the colours for this purpose consists in bringing them to a due state of fineness by grinding on a slab in turpentine, or they may be purchased ready ground in metallic tubes. The best varnish for binding and preserving the colours is shellac; this, when judiciously managed, gives such a firmness, solidity, and hardness to the work, that if it be afterwards further secured by a moderately thick coat of *seed* lack varnish, it will be nearly as hard and durable as glass. Many who practise japanning for their amusement, and do not wish to encumber themselves with the preparations necessary for the more elaborate methods, may use water-colours tempered with isinglass, size, and honey. Water-colours are sometimes laid on grounds of gold and silver, and managed in such a manner as to have the appearance of embossed work, formed of strong gum-water or gelatine, thickened with armenian ball and flake-white in equal proportions. This, laid on to the design, and forming, as it were, a raised outline of the form and figure required, it is repaired and pieced up when dry, and may then be painted with the various appropriate colours tempered with isinglass size, or, in the general manner, with shellac varnish.

Some forty years back Varley, the painter and water-colour draughtsman, who was at that period a great authority in regard to "artists' materials," was in the habit of using a copal varnish, prepared by pouring on the purest lumps of copal, reduced to a fine powder in a mortar, colourless spirits of turpentine to about one-third higher than the copal when placed in a wide-mouthed bottle: this must be kept in a warm place, shaken several times during the day, and, in the morning, the clear top varnish poured off for use. Successive portions of turpentine may be used with the copal in the same way. When properly applied and allowed to dry slowly, it is extremely transparent, very hard and durable, preserving and giving great lustre to oil-paintings, restoring the decayed and faded colours of old pictures, filling up the cracks, and rendering the surfaces of reflected light much more uniform.

In conclusion, we have only to say that amateurs and others who may wish to introduce photographs as ornaments to japanned surfaces must be entirely guided by their own taste and judgment in the introduction of the various subjects, whether on paper, transfer-cloth, leather, or on glass; the three latter substances should be let into the japanned surface, so as to be quite flush or even with the ground. Those on glass in some pieces of furniture could very well be inserted with the preserver, as that would form a beading or rim round the same.

A NEW DEVELOPER FOR NEGATIVES.

BY M. CAREY LEA.*

It has seemed to me probable that if an organic matter could be chemically combined with an iron developer, we might expect to obtain a development uniting the advantages of an iron and a pyrogallic development,—the delicacy and detail of the one, and the force of the other.

An attempt had already been made in this direction, and not without a share of success. A so-called saccharo-sulphate of iron has been tried, and, by some operators, liked. But it appears extremely improbable that this developer, made according to the usual directions given, can contain the sugar in the form of a combination; it has, indeed, been formally asserted that sugar will crystallise with sulphate of iron in any proportion, depending altogether upon the quantity of each that chances to be present. Besides, we know that sulphuric acid is capable of forming a large number of conjugated acids with organic substances, but in every case the organic body must be presented to the free sulphuric acid. In no case does the union of the organic body with the acid take place when the latter has been first combined with a strong base. It is, therefore, I think, pretty clear that the term "saccharo-sulphate," as used in photography, is a complete misnomer. To obtain a true saccharo-sulphate of iron, it is essential that the saccharo-sulphuric acid be first formed, and be subsequently combined with the iron.

It seemed to me, therefore, probable that a true sulpho-conjugated salt of protoxide of iron would have great advantages as a developer, and I therefore concluded to make the experiment, using *gelatine* as the organic substance. I obtained a developer of excellent qualities, very manageable, giving all the detail of sulphate of iron, and a strong, dark image, like that of pyrogallic acid; rarely requiring redevelopment, and giving light, clean negatives, with singularly little tendency to fog by prolonged use of the developer.

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* From the *Philadelphia Photographer*.

I shall now proceed to give the mode of preparation of this developer. The result of a number of experiments, varying the details, was to give two processes, both very satisfactory, differing little from each other. They are as follows:—

(1.) Let an ounce of good gelatine soak and swell in two ounces of water. Apply a gentle heat (very gentle), and, when solution is complete, add five fluid drachms of sulphuric acid. Stir the mixture very thoroughly, pouring in the acid by degrees, and keeping the fluid actively agitated all the while. Combination begins to take place at once, the gelatine becomes far more fluid, and acquires a very peculiar odour. Set the vessel aside for twelve hours, to let the combination of the acid and the gelatine become complete, and then add iron filings in excess. The conjugated acid saturates itself with iron far more slowly than does simple sulphuric acid. The mixture should also be diluted with its own bulk of water, and set in a cool place, and occasionally stirred. In two or three days the acid will be saturated. To make sure that no free sulphuric acid shall be present, throw in, just before filtering, a little acetate of soda; half a drachm will be enough. Then filter, and dilute to 15 ounces.

Another method, differing slightly from the foregoing, is as follows:—

(2.) Add an ounce of sulphuric acid to three ounces of water, and set aside to cool. Then add to this liquid an ounce of good gelatine; let it swell and dissolve, placing it for that purpose in a gently warm place, not exceeding blood heat, for twenty-four hours. Then add iron filings in excess, avoiding all application of heat; let stand for several days. Finally, add a little acetate of soda, filter, and dilute to 15 ounces.

These two processes do not give an identical result; the first gives a browner solution than the last, which is not much unlike a simple solution of sulphate of iron in colour.

I would recommend those who may try this developer to adhere to one or the other of these formulæ. Others which I tried, and which differed from these in points seemingly quite immaterial, gave decidedly inferior results. Of the two formulæ which I have given I prefer the last, and it has the further advantage, that a person inexperienced in chemical manipulation would be less likely to make mistakes in using it. It is very curious to observe the power which the gelatine exerts as a restraining influence.

This developer contains a very large quantity of sulphate of iron, much more so than is usually employed in a developer, and yet it stands in need of no free acid to check it; and the restraining is so effectual that it may be kept on the plate twice as long as a common iron developer without fogging. In this respect, as well as in the colour which it gives to the image, it resembles pyrogallic acid.

The restraining influence which gelatine is capable of exerting upon the precipitation of metals by reducing agents is very curious and marked. I had occasion to advert to it in a paper which I published on photogalvanography. In that instance, it was necessary to gild films of gelatine which had been acted upon by bichromate of potash and light. I brushed them over with an ethereal solution of protosulphate of iron. We know that when solution of protosulphate of iron is added to a gold solution, the whole of the gold is immediately thrown down in the metallic state. But in the above instance, the retarding effect of the gelatine caused the precipitation of the gold to be slow, incomplete, and irregular, and it was only by calling in the powerful reducing influence of the sun's direct rays that I succeeded in obtaining an immediate precipitation, and a uniform coating of gold.

In the case of silver, the restraining influence of the gelatine was less marked. But for the purpose of negative development it is more efficient than acetic acid, and, in fact, just sufficient to give the effect required.

I have very carefully compared the action of this developer with that of an ordinary iron developer in the following manner:—I take several small, clean porcelain capsules, pour the developer into each, using a measured quantity, and add a little solution of silver to represent the bath solution on the plate, when ready for development. Then I observe what time elapses before a deposit begins to manifest itself on the bottom of the capsule. This may be done by daylight or by gaslight, and the whole operation be watched in a very satisfactory and instructive manner. I found that an ordinary developer (that which I used was made as follows: water, 60 ounces; protosulphate of iron, 3 ounces; acetic acid, 4 fl. ounces; alcohol, 3 ounces), when mixed with bath solution, would begin to fog in from fifteen to twenty-five seconds, whereas the gelatine developer remained from fifty to sixty seconds, or about three times as long, before the action set in. Now, when the gelatine developer (although containing a much larger proportion of sulphate of iron) is poured upon an exposed plate, development instantly commences, so that the long time which elapses before a tendency to fog sets in is a real advantage which everyone will appreciate.

It appears to possess the advantage of a strong developer, in respect to bringing out detail, at the same time that it can be left long on the plate to complete the development of a weak impression without danger of fogging.

There is also something in the consistency of the solution which renders it very pleasant to work with. While the viscidity of the gelatine is quite gone, there is a certain oiliness in the liquid which makes it cling to the plate, and flow evenly over it. It seems, too, to be more independent, in this respect, of the condition of the nitrate bath, as respects alcohol, than an ordinary iron developer; and the absence of tendency to fog renders it allowable to simply add nitrate solution where redevelopment is required.

It thus becomes practicable to quite dispense with the pyrogallic redevelopment in all cases. Except by this new method, pyrogallic acid can scarcely be replaced, except, indeed, by gallic acid, which I have used in the absence of pyrogallic. Mixed with nitrate of silver in solution and acetic acid, it presently assumes a purplish, inky colour, but remains clear, and redevelops very well.

Whenever a new developer is recommended, it becomes a matter of interest to know whether the negatives made with it will be permanent. There is nothing in this developer which would tend to a contrary supposition, and some negatives which I developed with it nearly a year ago are in perfect order. Since that time I have had it in use, and would not be without it. It brings out the half-tints and details in shadows very agreeably, and tends to yield soft and pleasant prints.

As respects its keeping properties, I think it can be relied on for two months, which is ample time. I have some now which is full six months old, and which still develops well—not, however, I think, quite so well as the fresh, but certainly better than the common developer.

I would especially warn those who may prepare this developer for themselves, to apply heat only as directed in the formula, and not to any greater extent or degree. If, for example, heat be applied to expedite the solution of the iron, a decomposition appears to set in, and the liquid obtained, though it may still develop, will not possess the good qualities of that prepared strictly in the manner which I have described. In the second formula, scarcely any heat is allowable, and that is the one which gives the best results.

The proportion of gelatine which I have directed to be used is that which seems to give the best results, and is abundant to fulfil its functions of restraining the action of the developer within proper limits. But as gelatine has a high equivalent, it is, of course, not enough to saturate the acid; and, consequently, when iron is introduced, simple protosulphate of iron is formed, as well as any organic salt of iron which may result from the action of the sulphuric acid upon the gelatine. This sulphate of iron crystallises out, and is by no means to be rejected, but sufficient water is to be added to keep it in solution as the process goes on. The quantity directed to be added at the end is more than sufficient for this purpose.

Although I had had a considerable experience in the use of the foregoing method of development in the interval since I first imagined it, and although I found it so preferable as to have adopted it for regular use, I still hesitated to publish it as being more advantageous than the old method, without first making a strictly comparative trial.

Taking for this purpose a cloudy day, when the light was quite uniform, I pointed my camera out of the window, and took five negatives in rapid succession, giving to all an equal exposure. The first and fourth of these were developed with the common iron developer, the rest each with a different specimen of the developer here described. The result was such as to justify my prepossessions in favour of my own plan, and to remove any hesitation I felt in publishing it.

The exposure was intentionally made a very short one in proportion to the light and diaphragm. The plain iron developer which I used contained but little acetic acid, and was, therefore, what might be considered an energetic one. In all five cases, the development was pushed to the verge of fogging, so that each might do its utmost, and, finally, the results were carefully compared.

Two of the plates developed with the gelatine developer were decidedly the best, were stronger and brighter, and had more detail. In these, the developer had been prepared within a reasonable time. A third plate, developed with some of the same developer, seven months old, was scarcely so good, and might rank along with the other two plates, which were developed in the ordinary manner, with protosulphate of iron and acetic acid. This, taken in connection with many previous trials, seems to justify the preference which I accord to the new method.

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THE MISSION OF PHOTOGRAPHY.

BY CALVIN THURBER.[*]

It needs no prophetic power to foresee the noble mission that photography has yet to unfold to man. What the art of printing has been and now is to literature, photography will some day be to art. And there is a delicate analogy that may be traced out in the mission of these two arts. Both came to reveal to man a new world, and are most emphatically the arts of the people, and the educators of the masses. Before the advent of the art of printing the masses were sunk in the lowest ignorance. To them the world of thought, of intellect, and of truth was a circle so exceeding narrow that it was almost a living grave. The art came, and, under the fostering sunlight of a purer thought, the mind grew up until its vision was above that narrow circle, and it looked out upon infinity. Compare the fourteenth with the nineteenth century, and say how much man owes to that art for his present elevation; and yet there were, no doubt, minds *then* that could not see how the art could ever be the means of raising man to his present position: and, no doubt, there are minds *to-day* which can see no future good to come from the cultivation of art. But this is no place to attempt to prove the value and necessity of the understanding of art in the education of man. This is a point which must be taken for granted. We know that man has not learned all. What he has learned is but a single atom to the mountain of the unlearned; and there is a world which, to the masses of mankind, is to-day sealed in impenetrable mystery, though revelations from it are scattered around him so plentifully that he cannot open his eyes and not see them. The world of beauty and art is the peculiar language by which the truths of that world are expressed. But hitherto the expression and influence of all high and true art have been circumscribed by the narrow circle of the rich and great; but that can be so no longer, for photography, with the wand of a sunbeam, has swept away all of these patrician bounds, and has said, "Let there be light." No longer can the favoured few monopolize the elevating and ennobling influences ever exerted by true art; as well might they attempt to buy and sell God's free sunshine, for through the instrumentality of photography is to spring up a love and knowledge of art that will find its way to the homes of all, even the humblest in the land. To the poor cottager, whose means would scarcely allow of his travelling beyond the limits of his own State, it comes as the fruitful story-teller from the remotest corners of the earth, and by his own humble fireside he can study the glorious, the sublime, and the beautiful in art and in nature, and his mind catches a spirit of refinement from communion with these things of beauty that will almost insensibly steal in and influence his everyday life. Like every great step, photography will lead to great results; results of a different character, it is true, from those produced by the invention of the steam-engine, but still none the less necessary to man's advancement, though they may be underrated, for the resulting influences of art are ever quiet and unobtrusive in their action, coming to fulfil their mission only after man has learned the sterner and more practical lessons of life. Man has learned these harsher lessons, and to-day his mind is ready to receive the softening and polishing touches of art, and sun-painting comes to teach him its alphabet and its first simple principles, gradually correcting the taste, arousing the judgment, chastening the imagination, and pointing the mind to that which is above itself.

Such is the mission of our art-science to the masses. It comes to scatter with lavish hand the elevating influences of a true art around their humble hearth stones, acting as interpreter to them of all that is beautiful in art and nature. But it has a lesson, too, for the cultivated and refined. Even he who has spent a life of devotion in the study of the profound principles of high art may sit beneath her teachings and learn some useful lesson. Photography comes to elevate and purify all art, and to exalt the standard of artistic merit. Her advent is infusing into the world of art an element of truth such as never existed there before. She is to be not only the teacher of the masses, but also the teacher of the disciple of art. He can no longer be a mere copyist, for the camera can do that work far better than he can ever hope to, and he is thus driven to take a step higher into the field of cultivated imagination, and to idealize the truth which photography gives him, and, by so doing, a new and vital impulse is given to his profession. Such being the dignity of our noble art, let its followers never lose sight of the fact that he who stands beside the camera has no less need of artistic instincts and feelings than he who stands before the easel; and if a true man and a true artist, he who paints with a sunbeam will exert no less an influence than he who holds the brush.

The one works with crude material and simple art, subject to all the imperfections which must ever steal into the productions of the pencil; the other works with an art married to a science as exact as the laws of mathematics, producing pictures beside whose severe truth the work of the most exacting pre-Raphaelite would sink down to a mere daub.

Then let every follower and disciple of our art be conscious of the dignity and responsibility which his vocation imposes upon him, and let him be true to them both, as becomes a man and an artist.

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[*] From the *American Journal of Photography*.

A SHORT LESSON ON PLATING AND GILDING.

BY PROF. TOWLER.*

Several of our subscribers have requested us, at different times, to be instructed in the art of Galvanic Plating and Gilding. We yield to their solicitations from the consolation of our misgivings by finally concluding that Galvanic Plating and Gilding are in much probability a key to the rationale of photographic action. The development of the latent image on the film of collodion, may it not be produced by electricity decomposing the metals in solution? And the toning of the silver film on the albumen print by the deposition of a film of gold, may it not likewise be attributed to the decomposition of the electrolyte (toning bath of chloride of gold) by means of fluid elements or otherwise not yet clearly understood?

If we answer in the affirmative (and we are neither the first, nor is this the first time that such a supposition has been entertained), it is evident, then, that a short lesson on Plating and Gilding will not be irrelevant to the science of photography.

Materials required in this Art.

The first thing required is a galvanic battery.

There is a great variety of galvanic batteries to be had of the various dealers in philosophical instruments, etc.; but from long experience in these branches we prefer a Grove's battery to every other. A single element consists of a cylinder of zinc, a thin plate of platinum, a tumbler, a cell of porous or unglazed earthenware, two binding screws, two solutions (dilute sulphuric acid and concentrated nitric acid), two connecting wires, and a plate of silver and one of gold (a two shilling piece for one and a gold dollar for the other).

Two of these elements will be sufficient for almost all ordinary operations of gilding, and sometimes only one is required. The zincs, plates of platinum, porous cells, binding screws, tumblers, and connecting wires can be bought already prepared for electrolytic operations and ready for mounting.

Mix one fluid ounce of commercial sulphuric acid with ten fluid ounces of water for one solution.

The strongest aquafortis or commercial nitric acid is suitable for the other solution.

In the second place a silver and a gold solution have to be prepared and kept on hand ready for use. Each of these solutions is denominated an *electrolyte*, and the art of decomposing such a solution by means of an electric current is known by the name of *electrolysis*.

To Prepare the Silver Solutions.

Take an old silver bath, or a solution of nitrate of silver, and add to it a solution of kitchen salt as long as any white precipitate is produced. It is better to perform this operation in the dark room, because the white precipitate (chloride of silver) is very sensitive to light, thereby changing into a violet-coloured powder, which is insoluble in the fluid into which it is subsequently mixed. As soon as the precipitate has completly subsided, pour off the supernatant fluid, and add to it a few drops of the salt solution; if no milkiness is produced, the silver has all been removed as chloride, and consequently the fluid may be thrown away as useless.

Mix the white chloride with rain-water, and stir the mixture with a glass rod, and allow the precipitate to settle again; this is called washing the precipitate. When the precipitate has subsided, the fluid part is poured off, and the residue is again washed. This operation is repeated several times, and the chloride, finally separated by decantation from the wash-water, is ready for the next treatment.

Make a saturated solution of cyanide of potassium in rain water, that is, add lumps of the cyanide as long as it is dissolved, and finally a small part is left undissolved. The water is then saturated with the salt. Pour this saturated solution of the cyanide upon the chloride of silver, and keep pouring and stirring until the chloride is entirely dissolved. Filter the solution and dilute as follows:—

Silver Electrolyte.

Saturated solution of the chloride of silver in cyanide of potassium ...	4 ounces
Rain water	12 „

This solution is now ready for use.

To Prepare the Gold Solution.

Make a saturated solution of cyanide of potassium as before, and pour off this solution upon the contents of a 15-grain bottle of chloride of gold until the latter is quite dissolved. Then dilute with water in the same ratio as in the silver electrolyte, that is, one part of the solution of chloride of gold in cyanide of potassium, with three parts of water. This solution filtered forms the

Gold Electrolyte.

To Mount the Battery for Plating or Gilding.

If the article or articles to be plated or gilt are small, a single element will, in all probability, be sufficient to produce the requisite amount of electric current. Place the zinc in the middle of the tumbler, then insert the earthenware cell in the zinc, and holding it down with the left hand, pour into the tumbler dilute sulphuric acid until it reaches to the upper rim of the cell. The cell itself is next filled with concentrated nitric acid. The plate or strip of platinum is finally inserted in the nitric acid.

The zincs are generally amalgamated when you buy them; if this operation has been omitted, you can do it yourself by rubbing over the moistened surfaces a cloth dipped in nitrate of mercury.

Place one connecting wire in the zinc binding-screw, and the other in the platinum binding-screw. The zinc wire is the *negative pole*, and is frequently called the *zincoid*; whilst the platinum wire is the *positive pole*, and is denominated the *platinoid*. At the end of the negative wire the object to receive the deposit is *always* placed by suspension on a hook, or otherwise in metallic contact, and then immersed either in the silver or gold electrolyte, as the case may be.

But on the end of the positive wire, either the piece of silver or of gold is fixed according to circumstances; that is, if the electrolyte be silver, the silver plate is attracted, and the gold plate in the other case.

The silver and the gold coin can be beaten out on the anvil into thin plates for the purpose, and then soldered to their respective wires, or attached by drilling holes and then suspending each on a hook at the end of its respective wire.

(*To be continued.*)

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A NEGATIVE REQUIRING NO INTENSIFYING.

BY JEX BARDWELL.*

Those readers of the Journal who would wish to try my formula for negatives needing no after developing or intensifying, and have been in the habit of using the ammonia salts, will perhaps find the following formula more under their control:—

Collodion.

Alcohol	4¼ ounces
Ether	3¼ „
Gun cotton	80 grains
Iodide of ammonia	56 „
Bromide of cadmium	16 „

Developer.

Water	17 ounces
Ammonio-sulphate of iron ...	1½ „
Acetic acid No. 8	4 „

The silver bath prepared as before.

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* From *Humphrey's Journal.*

* From *Humphrey's Journal.*

Mr. M. Carey Lea remarks, in the *Philadelphia Photographer*, that the proportion of pyroxyline, of iodide, and of bromide seems excessive. It would seem so to many who have been in the habit of only using 5 grains to the ounce, but it must be remembered that the iodide of lithium and ammonium both tend to render the collodion fluid, and I will admit that for large plates it would be too heavy, especially in warm weather; but the above formula was composed with a view of working small plates for carte de visite portraiture, and I think if Mr. Lea will give this formula a trial, he will justify me in urging its merits. A very great deal of the perfection of the negative will depend on the correct timing and careful management of the developing. I have heard many operators say that time, comparatively speaking, was of no moment, because you could force it up, or, if over-timed, by fixing and intensifying make still as perfect a negative. Now all this is not so; it is true that a negative that might otherwise be spoiled is saved; but the negative that is correctiy timed is always superior to the one that has to be managed. Correct time is of very considerable importance where the negative is to be made at one operation; for, if too little, the contrast is too great with no detail in the shadows and the shades very heavy; and, if over-timed, you can get no intensity without fixing and intensifying; but with the time right you can get a negative of sufficient density with the detail all brought up and with more perfect modulation of the half tints (provided the light has been properly managed) than can be produced by the piling up of the deposit. I urge the use of the ammonio-sulphate of iron for the following reasons: it gives more intensity, and also by reason of the peculiar colour of the deposit, and also by allowing the developing to be continued to almost any extent without causing a deposit in the shadows, and never, unless with a dirty plate, of causing that iridescence of the film in the shades so often noticed when using the old formula.

With regard to the silver bath, I have taken one condemned by an operator as totally unfit for work, and, by boiling it, with sufficient bicarbonate of soda to cause a precipitate, until the precipitate turns black, and then cooling and filtering, formed a bath perfectly satisfactory in every particular.

In making collodion I observe the following precautions. Ether that has been kept in stock is very apt to become more or less acid, and I have had mishaps that I could trace to the alcohol, but from what cause I could not so readily determine. I find it a safe plan to put into each quart of alcohol and of ether as much precipitated carbonate of lime as will lay on a half dollar piece, and shake it up well; it will soon subside. Then measure your alcohol and dissolve in it the bromide; see that it is all dissolved before adding the iodide, and, when dissolved, add the cotton and then the ether. I fancy—and still it may be only fancy—that by dissolving the bromide before the iodide the collodion is more sensitive; it certainly retains its straw-colour much longer than when the iodide is dissolved previous to the bromide.

The above collodion will be found excellent for the tannin process. You know the old saying: "The proof of the pudding is in the eating," and I will venture to say that anyone who has had sufficient practice in that process to be able to judge of the difference, will have less failures from any cause than with any formula for collodion published in connection with the tannin process.

CLEAN HANDS.

BY PROF. TOWLER.*

Rara avis in terris *nigro*que simillima *cygno*.

We have been accustomed from the beginning to accompany photographic experiments with their natural results—the blackest dyes, *black* fingers, *black* shirt collars and wristbands, and *speckled* pantaloons and vest. Our *Better-half* asserts positively that if she were ever again a blessed single female (which God forbid! for she's a jewel of a woman, although it's we that say so), she would never ally herself for better and for worse ("for," says she, "worse it could not be, not even with a travelling black minstrel or a chimney-sweep ")—never ally herself with a photographic chemist, or the head of a Daguerreian gallery.

"Bah!" Mr. Caudle, " you are no chemist, otherwise you would soon devise some method of keeping your hands clean and neat like those of any other Christian——; now don't be wicked and say that Christians can go to the ——. You didn't say so? Oh, Caudle! to think of the time I first saw you at Syracuse; you had just entered as Freshman in Hobart Free College—so prim, so gentle, so mild, and so religious! You weren't religious? Ah! how times have changed—'tempora mutantur, mutantur tempore mores.' Now stop that gibberish; it is not becoming of you to treat the wife of your bosom with such heathenish remarks. At that time, Caudle, I thought you were just like an angel; your linen then wasn't all black as now. You're a fallen angel? Yes, you are; and your heart is getting as black as your outside——. All this comes of going to college? Well, I believe it does. When you entered the college you were modest, moral, and loved and obeyed your mamma and me; arrived at the second year and trumpeted abroad as Sophomore, *verdancy* and *virtue* were left behind. You never were verdant? But you were honest, Caudle, and these are about synonymous expressions in college slang. Haven't you told me hundreds of times how you shot Squire ——'s geese, and stole his wood, his cider, and grapes, and then invited him to a jolly supper at No. 12 Trinity Hall? and how you pretended to be asleep in bed when old Prex entered? You did not tell me so? What a flexible memory you have! But all this comes of going to college. And your black hands and your black shirts —do they come from going to college? I have no doubt of it, Caudle; you contracted these dirty habits from practising nigger-minstrels in Loomis's Woods; and when you became older you could not throw aside habits that had become a second nature. I won't stop preaching until you devise some method of keeping your hands and linen clean."

Such were the expressions we heard in one of the photographic galleries in Rochester a few weeks ago; and passing through another gallery in Buffalo, in company with a Canadian, or perhaps more correctly an Englishman, judging from his intonation and education, we found a lady, young, beautiful, and gifted with much of Eve's pretty loquaciousness, at the head of the establishment. She posed the model, coated the plate with collodion, immersed the same in the silver bath, then *hooked* it out again with the *tips of her fingers*.

The man of Eaton exclaimed, after scrutinizing her digital processes and on leaving the gallery:—

"Rara avis in terris nigroque simillima cygno." And added, "Can't you chemists remedy this evil? If it were not for those black fingers, I would propose to that girl and make her mistress of my lands and tenements in Kent."

A match lost on account of black fingers! Miscegenation below par! Creation frustrated in her plans by reason of a couple of black hands!

"Can't we devise something?" we reiterated; "this will never do any longer. Sweet Jennie by this time might be across the Atlantic and be aiding to civilize our fossil progenitors and teaching them how to eat Indian corn in the cob."

"Eureka!"

So said a modern Archimedes when he projected the Gridiron Plate-holder.

The plan is the following, a mechanical plan and not chemical! This is the better of the two; like as the magneto-electric machine, which owes its efficacy to a winch and a revolving magnet, is preferable to the electro-magnetic double helix and electrotome, where the electric current is generated by means of nitric and sulphuric acid.

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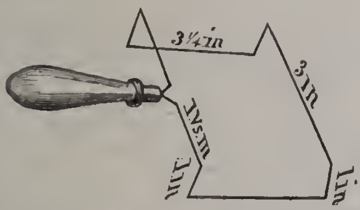
* From *Humphrey's Journal*.

Each differently-sized plate requires a special Gridiron-holder during development and intensifying; and one pair of forceps, prepared in a manner as herein set forth, is used for *hooking out* the plates from the silver bath.

Gridiron-Holder.

Supposing you wish or have to develop a stereoscopic negative, the plate containing which is six inches and three-quarters long by three inches and one quarter wide; then proceed as follows:—Cut out a piece of very flexible brass wire nineteen inches and a half long and one-eighth of an inch thick, or thicker where required. Next procure from an india-rubber establishment a piece of gutta-percha or india-rubber tube sixteen inches and a half in length, and of a bore fitting tightly upon the brass wire when the latter is inserted. Leave an inch and a half at each end of the wire uncovered. Now bend the wire according to the following directions: At a distance of an inch and a half from the centre, on either side, bend the wire at right angles in the same plane; at a distance from this angle of one inch bend the two ends again at right angles, but perpendicular to the former plane; thirdly, at a distance of three inches and one-quarter from the last angle, on either side, make another rectangular bend and perpendicular to the plane in which the two preceding branches lie (that is, supposing they lie on the table, then make the new branches perpendicular to the table); fourthly, at a distance of one inch from the angle bend the remaining pieces again at right angles and towards each other, so that they lie side by side. Finally, bend the pieces at a distance of one inch and a half from the last angle rectangularly outwards, so as to form two projecting pieces lying side by side, to be inserted into a wooden handle such as is used for bradawls or springbits. The Gridiron-holder thus formed has the following appearance:—



The negative is inserted between the two parallel sides, and nearly to the bottom, where it is held by the elasticity of the wire in the indentations of the india-rubber tubing. If the holder is properly made there need be no fear of the plate slipping out, however much the holder may be moved about.

Jennie, of Buffalo, if you had had a Gridiron-holder you would now *hold* a worthy, intelligent, and honest husband!

Forceps.

The forceps, or properly pincers, which we use in order to remove the plate from the silver bath is one of that form which closes firmly of itself by means of a strong steel spring rivetted on the inner sides of the branches which serve for handles. The faces of the mouth-piece or biting part are flattened like those of a vice, and are covered each with a piece of india-rubber which is cemented to the steel face by means of strong lac varnish.

It is evident from the construction that, by pressing the handles asunder, a cavity can be formed between the india-rubber facings for the reception of the sensitized plate when raised from the silver bath. Thus grasped, the plate is allowed to drain, and is then inserted in the plate-holder without soiling the fingers. After exposure it is removed from the plate-holder by the same forceps, and inserted in the Gridiron-holder for further treatment.

A glass rod or a narrow slip of glass will be found a very useful appendage in the left hand to raise the plate from the plate-holder, in order to aid in grasping the plate with the pincers in the right hand.

With these two simple contrivances, Mr. Caudle will undoubtedly regain the pristine appreciation of his verdancy or honesty which he possessed when he first entered college. Caudle, if you love a good night's rest, buy them; if you hate scolding from your wife and the washerwoman, buy them; linen and shirting are horribly dear; only think of it, four pounds of butter for a yard of calico! Buy them, make them, or, according to collegiate ethics—hook them!

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POSITIVES WITH DOUBLE BACKGROUNDS.

BY M. CASSAN.

M. **Crozat**, of Seville, recently addressed to all the photographers of France specimens of proofs with a double background, bearing his name traced by light, and he proposed to instruct them in the method for the modest sum of one hundred francs.

Experienced photographers can immediately comprehend, without an expenditure of one hundred francs, by what means such results can be obtained, and yet proofs with double backgrounds are but little known in France.

The silence of the photographic journals on the system of double backgrounds leaves the process still a matter of speculation. I have now the honour of publishing a method which gives unexceptional double backgrounds, and which will certainly spare my colleagues the expense of buying the Spanish system.

I am ignorant of the method employed by M. Crozat and his pupils to obtain the kind of proofs in question, but by operating in the manner I now describe we may infallibly obtain results similar to those which come from Andalusia.

The following is the method that succeeds best. I print the proofs on graduated backgrounds in the usual manner. When the first proof is sufficiently printed, and before disturbing the place it occupies on the negative, I trace a mark on the collodion which perfectly coincides with two sides and an angle of the printed sheet. If the mark is well drawn, all the positive proofs from the same negative, taken from the pressure-frame, may be replaced upon the negatives exactly in the places they occupied during the printing of the picture.

The ordinary intensity being obtained, and each proof being carefully placed before exposure to the light, take one of these proofs, tone, fix, and wash it in abundance of water. When the picture is dry, carefully cover the face, neck, shirt, and the lighted portions of the hair (but not the light parts produced by the gradation of the drawing) with vermilion ground in water applied with a camel-hair pencil. The proof thus marked will be the *screen* for printing the double backgrounds of the subsequent proof.

Each negative will require a *screen-proof* treated in the manner indicated.

Before commencing the operation of the double background, have a glass plate, of about a quarter of an inch in thickness, ground on one side, and bearing on the other the desired inscription engraved with a diamond, in a reversed direction. Rub into the engraved lines a little of the vermilion, and clean the plate, without removing it, with a piece of tissue paper.

Everything being thus prepared, put the screen-proof, face downwards, upon the inside of the glass of the pressure-frame. Cover this proof with the ground glass, inscription uppermost, and place upon this glass a sensitized proof already printed with a graduated ground, observing that the two sides and the angle of the mark on the proof are perfectly matched with those of the linear proof. The superposition of the two pictures being thus established, cover them, close the frame, and expose to diffused light until sufficiently printed. You will thus obtain a charming double ground, from which the inscription stands out in white letters.

The thick glass which separates the two proofs has the effect of annulling the slight difference which may exist in the superposition of the two pictures, and spreading the light so as to produce a uniform tint. The blacks and the reds of the screen proof arrest the action of the light upon the apparent design which is found opposite to it, while the light traverses the light parts of the said screen to print the double ground. This process, long in description, is very easily performed. It suffices to take a little care to attain perfection at the first trials.

A good *matching* of the sensitized sheets upon the negative is indispensable to *facilitate* the superposition of the two pictures (when printing the ground), and to insure at first a complete result.—*Le Moniteur de la Photographie.*

◆

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, July 12*th*, 1865.

M. Leon Cassagne has addressed a letter to the Paris Photographic Society respecting a *tour de main* which he believes to be advantageous in making enlargements. The following is a summary of his communication:—

After remarking that to obtain a negative for enlarging, the operator must select as a support either collodion or albumen, M. Cassagne reminds him that negatives obtained by means of these substances have very serious defects. Albumen, it is true, gives a very delicate film, but it is slow, and cannot, in consequence, be employed in many cases. Collodion is rapid, but it has a fibrous texture which becomes very apparent in the enlarged picture, and produces a very bad effect.

To avoid this inconvenience M. Cassagne proposes to make the negative to be enlarged by taking the picture on a collodioned plate, which permits of very short exposure, and afterwards copying this picture on albumen, converting it into a positive, and, lastly, to take a third picture from the second one, a negative, like the first, and upon albumen, like the second. This last negative, developed specially for the object proposed, is introduced into the enlarging apparatus. M. Cassagne advises that the second negative be made smaller than the first, and the third smaller than the second.

Upon this communication M. Davanne remarked that it is to be feared that the hope expressed by M. Cassagne of avoiding the defect in the collodion film will not be realized, for although invisible in the first negative, it exists none the less, and will be reproduced in the two succeeding albumen negatives, in microscopic proportions, it is true, but susceptible of becoming apparent in the subsequent enlarging.

The *Bibliothèque Impériale* was the first among the great institutions of Europe to open its galleries to photographers, but in discharge of its duty of carefully preserving the treasures it possesses it has for several years past found it necessary to refuse every application made to it to obtain permission to reproduce in photography the miniatures of manuscripts and rare engravings preserved in its collections. Fresh applications recently made have met with the same refusal, the result of which is that a public discussion has arisen on the subject, which is not without interest, considering how many important points are involved in the matter at issue.

Some twelve years ago permission was granted to amateurs and professional photographers, who had solicited it, to copy a certain number of the most valuable engravings. Soon afterwards the miniatures of several Greek manuscripts preserved in another department were placed before the photographic camera. In consequence, however, of these experiments, which were made with as much care and skill as the method admitted of, the *Bibliothèque*, in the interest of the future, and of the treasures composing its collections, decided that its miniatures and engravings should not be photographed. The necessity that exists for success in the operations of withdrawing the engravings several times from their frames, in some instances as many as twenty, and the still more disastrous necessity, as the result too often showed, of exposing these engravings to the action of a devouring light, and, in the case of the miniatures of manuscripts, the necessity for employing ligaments to keep the vellum flat and smooth, at the risk of thus causing the colours to scale off; these conditions, so perilous and mischievous, without mentioning other inconveniences, such as the want of a special operating room, the suspension of operations during intervals of several days, and the consequent want of a strict surveillance, to the prejudice of the public interest, all imperatively require that no more copies be taken, and that henceforth the treasures of the *Bibliothèque* must be protected from such dangers and risks as those incurred.

It has been asserted that other establishments abroad open their doors to photography. This is true, but it is also necessary to add that after having tardily imitated the example of the *Bibliothèque Impériale*, they no sooner observed the results of the experiment than they successively imitated it in formally withdrawing permission. The British Museum is one of these institutions, which, after a long interval, followed the example of the *Bibliothèque*, but has for the last three years excluded photographers from its departments of manuscripts and engravings.

In France, it is true, photographic operations continue to be occasionally authorized in the halls of the Imperial Museum of the Louvre, the Musée de Cluny, &c., but not upon rare manuscripts and engravings, like those preserved in the *Bibliothèque Impériale*. A page of writing may be submitted to the photographic operator with impunity, as the *Bibliothèque* itself has fully recognized in reproducing manuscript charters photographically. An object in metal, wood, or marble, has nothing to fear from the objective, beyond the operations necessary for placing the object in a proper position as to light, &c.; but it is quite otherwise with the treasures of the *Bibliothèque*, and the administration, it must be admitted, has acted wisely in withholding its permission.

It has been asked why the *Bibliothèque Impériale* does not impose upon some authorised person, in whom it has confidence, the condition of taking a duplicate of every negative obtained, and thus avoid, for the future, any further displacement of the objects copied. Now, in admitting that in view of the demands that in future may be made from time to time, they photographed once for all the engravings and manuscripts in the *Bibliothèque*, then persons who supplied themselves with these productions would be condemned to be contented with inferior results, supposing that material improvements should be made in the art such as the progress made during the past few years would lead us to expect. Thus we must either have imperfect copies, or renew them at short intervals, in proportion as improvements are introduced into photographic operations; lastly, a fifth department must be created at the *Bibliothèque*, where all the negatives successively taken shall be stored, and the positive proofs printed from them.

It is the duty of the *Bibliothèque Impériale* to second every intellectual effort, and to place all the treasures it possesses at the disposal of every class of workers, and to facilitate the reproduction of the works of art that compose its collections by every means which can be reconciled with the preservation of these works; it has the duty also of preserving these treasures not only from all material danger, but every invasion of a trading character. The *Bibliothèque Impériale* is an admirable scientific establishment this character will be profoundly changed if it becomes, as proposed, a manufactory of industrial products. The administration would in that case compromise the dignity of the present and the interests of the future. It will doubtless be disavowed by true artists and the friends of art, con strained in some measure to give place to mechanical processes; it would open the way and assure the ruin of the collections entrusted to its care, while it has the duty of preserving them to its successors as intact as its predecessors transmitted them.

As evidence of the success of the present Photographic Exhibition, it may be stated that the first edition of the catalogue was exhausted within a month, and that during the month of May the number of visitors was nearly 4,000.

PHOTO - BINOGRAPHY.

SIR,—In your impression of the 23rd June I was enabled, with your permission, to draw attention to the remarks made by Mr. Mayall, Mr. Le Neve Foster, and Mr. Hughes on the above subject at the Society's last meeting. As these gentlemen are silent, it is fair to suppose that they have become convinced that their assertions were premature and their theories untenable in the presence of the optical fact to which I referred them.

But whether this be so or not is a question of no scientific importance. I find, however, in the *Society's Journal* that the chairman has as prematurely endorsed these assertions and theories, and I think it is at least due to him that the gentlemen above-named at once eschew unauthenticated statements, and bring forward *facts*, capable of being examined, as I have done, with the view of placing me in the false position now occupied officially by Mr. Glaisher and the Society in the eyes of the scientific world. My aim is not to triumph over old theories, but to substitute truth for fallacy, a work of art with true perspective for a toy picture having no perspective; and I know that the only way of elevating photography into the dignity of a branch of the fine arts is by the pursuit of photo-binography. Who ever heard of a great artist having only one eye?

I note in your last number that Mr. Reeves, of Plymouth, follows in Mr. Hughes's wake. Assertion of a theory is not proof of a fact. The binograph being a double picture in one, cannot be called a single picture; it has, in fact, the lines and lights and shades of both the right and the left pictures, and the binocularity due to their superposition. This is easy enough to prove: take a stereoscopic picture, from a life-sized binograph, put it in the stereoscope, and it is as stereoscopic as a picture taken from life itself. Now, I think Mr. Reeves will not easily believe the stereoscope can be cheated, and if he does not, what becomes of his theory? If he will take the trouble to examine the matter fairly for himself, and not follow the lead of another man's opinion, he will find that whether the right and left binocular pictures are superposed at the junction of the optic nerves, or on a sensitive plate, the sense of relief is produced, equally in both cases, under the same optical conditions.

In the interests of our art-science, and, as I hope and believe, for the benefit of its professors, I shall be most happy to place everything necessary in the hands of the Editor of this Journal, if he feels disposed to appoint a committee of scientific friends to examine into the merits of photo-binography, and to report it as they find it. I am quite content to let the tub stand on its own bottom. My claim is simple; it is "the honour of having produced the first photographic picture in true perspective;" and as true perspective ranks in art before colour, this is something worth claiming.

In conclusion, I may say that I desire no better proof of the novelty of the discovery than the arguments advanced to show its impossibility.—I am, Sir, yours respectfully,

EDWIN PETTITT.

Birmingham, July 3rd, 1865.

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Photographic Notes and Queries.

ANILINE DYES FOR PHOTOGRAPHS.

MY DEAR SIR,—In reply to Mr. Heles' inquiry in last week's NEWS, I beg to say I have had photographs in my possession for more than two years, which were coloured with Judson's dyes, and hung in an ordinary lighted room during the whole of that time, and I cannot at present perceive any appearance of the colours fading, although some which were done at the same time and hung in my studio, which is, of course, much more strongly lighted, faded in a very short time.

My experience with the aniline colours leads me to conclude that, under the circumstances in which photographs are usually preserved, the colours *are* permanent; but they certainly will not stand sunlight, or the bright light of a photographer's studio.—Yours respectfully, J. M. BURGESS.

Southwold, Suffolk, July 4th, 1865.

ARTIFICIAL LIGHTS IN PHOTOGRAPHY.

SIR,—In support of your correspondent R. H. P.'s statement in your last impression, I beg to state that years ago, when engaged as printer in a town establishment, we had an old glass positive to copy: the young operator copied it the best way he could, but I was not satisfied with the printing quality of such a negative. It was winter, and my day-time was entirely taken up in printing: thus I took home the glass positive, and by the aid of a gas jet I obtained a good negative of it. Next morning I printed from it a far superior proof than I could from the other negative. On my showing it to the principal, he plainly told me he *did not believe it was copied by gas*. Determined not be done, I went home in the evening, and took a photograph of the gas flame, which I easily obtained, and next morning again I showed it to my principal, and said, "Do you believe it now?" He could not say it was taken by daylight, because there could not be seen any particle of the gas fittings, nor any other thing; magnesium wire was not in use at that time. And ever since all my experiments of comparative sentiveness, &c., are all made by gas-light, magnesium being too expensive for me as yet.—Yours truly, P. C.

ARTIFICIAL LIGHTS FOR PHOTOGRAPHY.

SIR,—In a communication from Mr. W. H. Olley, p. 267 of your Journal, it is stated that though a photograph of the *flame* of a candle is obtained by the magnesium light, yet not the least trace of the body of it is impressed on the sensitive plate.

I have since been trying it, and do not succeed with "a second or two" in obtaining *any* impression, but with a few seconds longer (say altogether ten or twelve) I obtain the photograph of *candle and* flame.

I enclose two of these photographs; the circumstances under which they were taken speak for themselves. I should be glad to know whether Mr. Olley gets the *structure* of the candle-flame (with the luminous and non-luminous cones) better defined than I have it; also whether my getting the candle as well as flame is simply that he gave it a shorter exposure than I did.

Hoping I am not troubling you by my queries, I am, Sir, yours truly, THOS. G. HOOKER.

Wellington, Somerset, July 4,

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Talk in the Studio.

THE NEWEST PHASE IN PHOTOGRAPHIC ENTERPRIZE.—A correspondent sends us a handbill containing the following very rich *morceau* in photographic puffing. We suppress, of course, the exact locality. "Startling News! The death of Barnum is not yet an historical fact, but as there are vast numbers of persons unable to have their portraits taken at the Great Gallery, 1001, Silver Street, during the day, arrangements will be shortly made to take *carte de visite* portraits All Night, by the New Magnesium Light, at 6s. per dozen. N.B.—Refreshments and Sleeping Accommodation for those who come from a Very Great Distance." The announcement is duly displayed with all the attraction of large type and catching lines. The nature and price of the refreshments are not stated; but we presume that the American drinks known as "corpse-revivers," "eye-openers," "smiles," &c., will be in request.

A NEW LIGHT.—The *Opinione* of Turin states that Professor Prospero Carlevaris, of Mondovi, has just discovered a new luminous substance, which is applicable both to photography and to the requirements of social life. This substance costs little or nothing. When brought into contact with a gaslight, it increases its intensity to an amazing degree without dazzling the eye like the electric light, or being intermittent, like that produced by magnesium. A few days ago Professor Carlovaris produced some photographs by his light at the Instituto Tecnico, of Genoa, in the presence of a numerous public, and the *Opinione* states that they were equal to any yet produced, both in accuracy and well-defined details. The process by which this substance is obtained has not yet been made public.

Magnesium.—The nature of the light emitted by burning magnesium has been recently investigated by Professor Schrötter, and his experiments published in a communication to the Vienna Academy of Sciences. M. Schrötter has obtained some important results, of which the most interesting are as follows:—The magnesium light promptly and powerfully produces fluorescent as well as photographic effects. This light contains an extraordinary quantity of ultra-violet rays, the spectrum of which is at least six times as long as that of the luminous portion. Crystallized platino-cyanide of barium, finely powdered or made into a paste with gum, so that it can be fixed on paper, gives a powerful fluorescence when exposed to this light. All substances which become luminous by isolation acquire this property in the highest degree by a few seconds' exposure to burning magnesium, whilst with the sun it takes from five to ten minutes to produce the same effect. The light re-emitted by these bodies has no photographic power, the absorbed chemical rays being degraded to purely luminous ones. It is further stated that if a piece of burning magnesium wire is brought near to the sides of a white glass cylinder, filled with equal parts of hydrogen and chlorine gases, drops of hydrochloric acid will be seen to condense on the portion of the cylinder nearest the wire. If now a second piece of wire is burnt on the opposite side of the glass, an explosion takes place almost instantaneously.

Projected National Portrait Exhibition.—A National Portrait Exhibition is to be held next year, under the management of the Committee of Council on Education, assisted by the advice of the trustees of the National Portrait Gallery and that of other noblemen and gentlemen. The Earl of Derby, with whom the idea appears to have originated, would admit either portraits of eminent men, though by inferior or unknown artists, or "portraits by eminent artists, though of obscure or unknown individuals." This latter provision does not meet with general assent. It appears to us that such an exhibition will be incomplete without an extensive collection of photographic portraits of public men. A distinct department might be made for these photographs. We commend the matter to the attention of those concerned.

Raffaelle's Frescoes.—A Parisian photographer has recently returned from Rome with twenty-seven plates of the frescoes of the Farnese Palace.

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To Correspondents.

J. H. (Oxford Street.)—The case is an unaccountable one, and we can only account for it on the supposition of some unknown impurity having got into the bath. Old negative-baths, strengthened, may sometimes be used for printing, but the iodide of silver present is often inimical to toning and to richness in the print. The amount of spottiness even in the best print is very distressing; such an amount of stopping out as it involves ought not to be required. We are not aware whether any of the baths of Messrs. Edwards and Son are kept in town yet. Pure chloride of silver is worth about three-fourths of its weight in pure silver, but if you take the bulk to a respectable refiner he will probably make an assay with a small portion and tell you its worth.

A. B. C.—No samples of paper were enclosed in your letter.

J. J.—Mr. Waldack's "Manual of Photography" is published at a dollar in the United States. We are uncertain whether it is to be had in this country or not. Probably Trübner, Paternoster Row, will have it.

Y. A.—The extreme limpidity of your collodion, and its deep colour, its insensitiveness, and its ten months of age, all suggest the probability of its having become partially decomposed. This would readily account for the slow appearance of the image and the scum and turbidity which arise during the process of development. You may possibly use it by mixing it with a very new sample; but you must do this carefully, trying a little first, before risking any quantity. It may probably be of little use except for cleaning plates; in which case take care of your eyes, as the fumes of old collodion are very irritating to tender eyes.

B. F. L.—The question as to whether you may employ a weak silver bath depends much on the proportion of salt employed in preparing the paper. A very heavily salted paper requires a strong bath, but there is no advantage in using a very strong bath with a lightly salted paper. With most samples of albumenized paper, a silver bath of from 40 to 50 grains to the ounce will answer. It is, however, better to have the bath a little too strong than a little too weak. 2. A too weak bath is apt to dissolve the albumen off the paper, and to become rapidly discoloured.

P. C.—Your pictures are badly lighted, under-exposed, and over-developed. Hence the flat expressionless faces of which you complain, and the want of detail in dark draperies. You want considerably more side light; with this, a little more exposure, and a less intensifying, you will get better modelled and softer pictures, which will, at the same time, be more pleasing likenesses. 2. Your tone is too black and inky. 3. The little landscape is too darkly painted, and has apparently been taken with a portrait lens with large stop; hence the bad definition and falling off in illumination at the edges.

D. G. Marsh.—The chief cause of your difficulty in securing a pleasing vignette arises from your use of too dark a background, which makes the transition into white paper appear abrupt, and the contrast too great. A very light background is best for vignetting. Vignetting-glasses have the advantage of permitting sun-printing; but it is better to print in the shade when a fine vignette is required, and to use cardboard with an aperture and cotton wool, or at least to supplement the vignetting-glass with a little cotton wool, so as to avoid the formal shape which the glasses usually give, and secure gradation and force suited to the subject.

R. E., Ilfracombe.—You will find a weak iron developer most easily managed, and give the best results for landscape work. 2. If you have found glycerine answer, which, if pure, it will, for keeping the plates moist, it would be unwise to change. We have recommended golden syrup and water because it is cheap, easily procurable, and safe; whereas we have heard of cases of fog from the use of impure glycerine.

F. L. M.—There is no work on the subject of photographic enamelling. The practical information on the subject is scanty; but you will find the bulk of it scattered through our pages. M. Joubert's process is patented; M. Camarsac's is a secret. Silver burnt in gives a yellow image of an unpleasant tint.

Old Photo.—The single landscape lens resembles the front lens of a portrait combination; but the latter is constructed so as to give the best results for one purpose, and the former for another; and therefore a lens especially constructed for landscape work generally has some advantages over the front lens of a portrait combination. 2. If you use a portrait lens for landscape purposes, you should use a much smaller stop than you employed in No. 1. 3. If you use the front lens of a portrait combination, it is customary to reverse the tube, and this brings the Waterhouse diaphragm in front of the lens. Read our article on stops in last volume, or in our last Year-Book. 4. Where there are no straight lines to be rendered, a single lens answers well for copying. 5. The white specks arise from minute air-bubbles, which have been caused when agitating the collodion, and which, being a thick sample, have not been able to escape before the paper was coated with it. 6. Apply the solution of wax with a piece of cotton wool or a linen cloth. Old collodion will remove it perfectly from the plates when necessary.

An Old Subscriber.—The print of a reduced copy of a page of the *Sun* newspaper is a photolithograph, by which especial process of photolithography produced we do not know.

Print.—Not having any commercial interest in the matter, we have not made much experiment with commercially-prepared materials for the purpose. We have described what we have used successfully. In some few instances we found irregularity in the sample of paper to which you refer. A common error we find in samples of collodio-chloride is the want of sufficient soluble cotton. This gives rise to irregular results in this way:—When the paper is coated slowly with a thin sample of collodion, the slow manipulation permits a thicker coating to remain on the paper. This gives a good image, whilst a thin coating of the same sample of collodion will give a weak image. We do not quite understand what you mean by not being able to get the collodio-chloride to settle. We have not sufficiently tried the addition of castor-oil to give an opinion. We have not tried sizing on the reverse side. The formula you give ought, with a suitable cotton, to give good results.

L. A. D.—The great heat of the weather has had a tendency to derange baths and decompose collodion. Try neutralizing, sunning, and strengthening your bath. If that fail, try a new one.

Lens.—If you had stated to which picture you referred, we could better have answered the question. 2. Dissolve shellac in wood naphtha or methylated spirit.

D. C.—The irregular toning is probably caused by the film repelling the toning solution in parts. This may be caused by the prints having been handled with greasy fingers. Sometimes the same result arises from the negatives having been handled with greasy fingers, and so slightly greasing the print in the pressure-frame.

Fine Weather.—The fog, which may be rubbed off, sometimes arises from organic matter present in the nitrate bath, sometimes from want of sufficient acetic acid in the developer, and sometimes from impure acetic acid.

W. S. B.—The minute bubbles are in some samples the collodio-chloride, and from the viscous character of the preparation do not seem able to escape. We know of no remedy except the use of a more limpid sample.

Attention to several communications and questions is unavoidably delayed until our next.

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Photographs Registered during the Past Week.

Mr. John Beattie, Strathearn House, Clifton, Bristol,
 Four Photographs of Sir Morton Peto, Bart., M.P.
 Photograph of Mr. Symonds.
Mr. Edwin Harrison, Newcastle-under-Lyme,
 Two Photographs of Wm. Shepherd Allen, Esq.
Messrs. W. and D. Downey, 9, Eldon Street, Newcastle,
 Two Photographs of the Earl of Derby.
 Two Photographs of the Duke of Sutherland.
 Photograph of the Duke of Manchester.
 Photograph of the Earl of Home.
 Photograph of Lord Dufferin.
 Photograph of the Marquis of Hartingdon.
 Photograph of Lord Chelmsford.
 Photograph of Hon. J. E. Denison.
 Photograph of F. Doulton, Esq.
 Photograph of Lord Brougham.
 Photograph of J. A. Roebuck, Esq.
 Two Photographs of the Earl of Suffolk.

THE PHOTOGRAPHIC NEWS.

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KEEPING QUALITIES OF COLLODIO-BROMIDE OF SILVER.

The question has been asked recently whether Mr. Sayce's collodio-bromide of silver would keep in good condition for use for any length of time. Not having as yet had opportunity of trying it as made by Mr. Sayce's formula, we could not answer with authority, but, judging from our own experience with analogous compounds, we had no doubt of its keeping qualities. Mr. Sayce has, however, favoured us with a specific statement of his own experience in the matter which is eminently satisfactory. He says:—"Collodio-bromide of silver, if carefully excluded from actinic light, will remain sensitive and in good condition at least a month after preparation; but if required for use after a week old, the stock bottle should be well shaken a few hours before decantation into the bottle used for coating the plates."

Whilst referring to this subject, we may mention that Mr. Sayce has forwarded us some further specimens of the process, amongst which is a ten by-eight print of a view in Wales, which is one of the most exquisite pieces of landscape photography we have seen by any process—so delicately soft and detailed, so perfectly brilliant and full of relief, besides being a charming and artistic picture. We look most anxiously for reports from many photographers; for if, as we are disposed to believe, such pictures can be uniformly obtained, few other dry processes can compare with this one in excellence of result, as none can vie with it in simplicity.

Whilst on the subject of Mr. Sayce's process, we may also add a word on another subject connected with it. There has been manifested in some quarters a disposition to pit Mr. Sayce and ourselves against each other as having antagonistic claims on the score of priority of invention of two distinct processes, the one a negative process, the other a printing process, but having analogy to each other in principle in the aim at simplicity. We know that these attempts find no favour with Mr. Sayce, and it is altogether unnecessary for us to enter in these columns into any defence of the originality of our own process. In regard to Mr. Sayce, we once more most emphatically and cordially express our conviction that his process was with him an independent discovery, and that to photographers it possesses the same merit, inasmuch as, besides having several original features distinct from any former one which had been tried, it possesses the especial and emphatically original merit of being the first practically successful method of securing negatives without a nitrate bath, and its success appears to be most unequivocal and complete.

PRECIPITATION OF COLLODIO-CHLORIDE OF SILVER.

Mr. Swan has addressed a letter to the *Photographic Notes* in reference to the case of precipitation in collodio-chloride of silver, described by Mr. Sutton, and mentioned in an article which appeared in the Photographic News a fortnight ago. We agree with Mr. Swan as to the wisdom of adding the chloride solution last. We have always made the collodion with alcohol containing the requisite proportion of nitrate of silver, finally adding the alcoholic solution of the chloride employed, and we have never met with a single case of precipitation. In some cases we have found, a few days after first making a sample, a slight precipitation at the bottom of the bottle. This, on examination, we have found to be simply particles of undissolved cotton; and after decantation from the stock bottle, we have found no further precipitate in samples varying from two to nine months old. Mr. Swan's letter to Mr. Sutton is as follows:—

Dear Sir,—I trust that you will ere this have received the second bottle of collodio-chloride, and that your experiences with it will have removed from your mind a misconception as to collodio-chloride being "always lumpy and uneven." I assure you that this is not only not a necessary condition of things, but a very exceptional one. What may have caused the precipitation of the chloride of silver in the sample to which you refer I do not know, but I think it very probable that it may have resulted from your manner of mixing the two solutions. I find it best to pour the chloride solution *always* into the silver solution, stirring all the while. When this rule is attended to, the collodio-chloride is a perfectly homogeneous milk-like fluid, appearing opalescent, and slightly yellow-tinted when viewed by transmitted light. I do not imagine that the chloride of silver is in chemical combination with the collodion, but it is certainly in an ultra-microscopic state of division, and has singularly little tendency to precipitate. I have examined some collodio-chloride that had been undisturbed for a month, and found that nearly the whole of the chloride still remained in suspension as at first, and Mr. Simpson says that he has found little or no precipitation three months after making. This, of course, refers to collodio-chloride mixed in the most favourable manner. It is ordinary citric acid that I found so valuable an ingredient in the collodio-chloride, particularly when used for glass-printing. I never used the phrase "a citric acid."

In reference to your remarks upon development-printing, the only objections which I remember to have urged against that mode of printing are that there is a tendency to loss of detail, and that it was comparatively difficult to obtain a perfectly accurate transcript of the gradation of shading of the negative. That these two objections are perfectly valid, and point to defects which are inherent in the process, I could bring very abundant evidence to prove; but on the other hand, I readily admit that in very many cases the loss of detail is quite inappreciable, and that in skilful hands the register of the lights and shades of the negative may be perfectly obtained; and even irregularity in this last respect may occasionally (I mean in the case of a defective negative) be turned to good account.

I have not seen the productions of Messrs. Burgess and Helsby, but I quite believe they deserve all the praise you have bestowed upon them. The great advantage which I claimed for direct printing upon glass by the Simpsontype process was its unparalleled simplicity. I am far from being unmindful of the merits of development-printing. I agree with you that it is very advantageous to be able to use a weak negative, although I greatly doubt if the time of taking the negative can be so far reduced as you say. But I must remind you that a thin negative is not only available for printing by means of the camera, it is equally available for the printing-frame process, provided the development principle be superadded. I have always felt that the rapidity of printing by the development process is a great point in its favour, and I entirely agree with you in the opinion that you long ago expressed, that developed silver prints are more likely to be durable than silver sun prints.

I have this week been applying the development principle to collodio-chloride printing, and with the most signal success. The idea with which I entered upon the experiments was to obtain greater depth of colouration, and less fading in the bath of hyposulphite; and both these results were accomplished perfectly. I developed some good impressions, made by an exposure of from two to four minutes of diffused light. Collodio-chloride prints on opal or transparent glass were also successfully developed after very short exposures. The application of the development principle to collodio-chloride printing will, I believe, very greatly increase its utility. There is a degree of transparency in the shadows that I never before saw in a developed paper print. I enclose a specimen or two, also a print on glass by direct printing, which will, I trust, convince you that there is no necessary deficiency of sharpness in such pictures. The want of it in the prints you have seen previously has, no doubt, been accidental.

Joseph W. Swan.

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SPLITTING OF THE COLLODION FILM.

There are perhaps few annoyances of the many that occasionally fall to the lot of the photographer more provoking than the loss of a fine negative by the splitting of the film when drying. The mishap is one which happily is not of frequent occurrence. Many photographers of extensive practice tell us they have never met with such a thing in long years of experience. We have not often met with it ourselves, and never, except from causes easily traceable, and equally easy to remove; but we have, on the other hand, known it to occur persistently in the experience of capable photographers, notwithstanding the apparent attention to all the known precautions. One gentleman, we remember, a professional photographer of considerable skill and repute, on one occasion having just completed, at a considerable cost of labour, as may be readily conceived, a series of views at the Great Western Railway station, on plates eighteen by fifteen inches, required for the aid of the painter of a well-known picture, had the mortification to see the films of very perfect negatives split and curl off the plate in the process of drying. The labour had to be gone through again, another sample of collodion being employed, which, all the conditions being the same, did not split or leave the glass. The collodion which split was one which was very sensitive, and worked admirably; but on other occasions, whenever it was used for very large plates, it retained the habit of splitting in drying. In this case the splitting was clearly the fault of the collodion. This tendency might result from several causes; but all, unfortunately, beyond the power of the photographer to remedy, except by discarding the collodion or applying some preparation to the film to give it adherence and tenacity before drying. Some samples of pyroxyline—that most nearly resembling gun-cotton proper, for instance—yield a collodion having a tendency to split, the film being at once contractile and tender, and altogether destitute of toughness or adherent qualities. In some cases a collodion made originally with a sample of pyroxyline yielding a tough film will, from the change effected by time, light, and air on the solvents, in the course of which acetic ether is formed, yield a film which splits, the original contractile character remaining, but the toughness and coherence being entirely lost. The collodion under such circumstances is not, it is true, in its best working condition; but it may frequently yield good pictures with sufficient exposure. When, however, it happens that a collodion in this state is used, it often also happens that negatives are slightly under-exposed, and thus the development requires pushing, to bring out detail and secure intensity. By this means another frequent cause of splitting is also brought into operation, the necessity of forcing the development and of much piling up in intensifying being amongst the fertile causes of splitting.

A correspondent, whose communications we always value, has on more than one occasion recently been troubled with this tendency in films to crack and curl up during drying, and was led from careful observation to conclude that unequal drying was a frequent cause of the film splitting, and that the tendency could be obviated by drying quickly and evenly by artificial heat. We can readily understand that when the tendency is present a very slight inequality in the drying of different parts of the film would induce splitting. Our own conviction is, however, that a predisposition to the defect must be present when such a cause brings it into existence. On this subject we shall be glad to hear the experience of others. In response to an enquiry on the subject made in our columns a few weeks ago, a correspondent, signing "A Photographer from Yankee-land," sends us an admirably practical statement of the chief causes of this defect, and its remedy; in which it will be seen he endorses our oft-repeated advice as to a remedy, namely, the application of dilute gum-water to the film before drying. If the tendency to split remain after all the usual remedies, we believe the dilute albumen or gum-water will always be found effective. We now subjoin our correspondent's letter and synoptical statement of causes and remedies:—

Sir,—Some time ago, whilst experimenting with a highly sensitive collodion in a very deficient light, I became the unenviable recipient of a very considerable number of visitations from that unpleasing phenomenon usually known as "The Splitting of Collodion Films."

After trying a large number of experiments, such as are mentioned in the treatises of Hardwich, Waldack, and others, I succeeded, to my great satisfaction (for splitting of the film had become with me the general rule and, not the exception), in attaining "universal success" so far as keeping the film upon the plate is concerned. I cannot say that I have much that is original to say, but nevertheless a general summary of my experiments may be of value to some of those of your readers who are so frequently troubling you for information upon this subject.

I append the little knowledge I possess, and remain, sir, your obedient servant,

A Photographer from Yankee-land.

Manchester, July 12*th*, 1860.

The phenomenon is most likely to take place—

1. When the pyroxyline of the collodion was made in strong acids.
2. When the collodion is iodized with cadmium.
3. When the glass has been imperfectly cleaned.

4. After prolonged development, especially when pyrogallic acid has been used.
5. In many, if not most of the dry plate processes.
6. When the plate has been rapidly and unequally dried.

The tendency to split is diminished—

1. By cleaning the glass perfectly. To do which it is advisable to soak in nitric or chromic acid solution before polishing.
2. By increasing the quantity of alcohol in the collodion.
3. By flooding the plate with alcohol before developing.
4. By intensifying with iron, after the first development, before using pyrogallic acid.
5. By fixing with cyanide, and afterwards intensifying with iron alone.
6. By using dilute alcohol after the final washing.

[I never knew splitting to occur when general attention had been paid to the foregoing, &c.]

1. The plate had after the final washing been coated with a dilute solution of gum-arabic; or—
2. After finally washing, the plate had been flooded twice with alcohol, and before drying varnished with any of the ammoniacal or other varnishes, which dry at ordinary temperature.

Note:—I have intensified a negative taken from an engraving with highly sensitive collodion in a very dull light, with *three batches of iron and thirteen of pyro*, without splitting, by paying attention to the foregoing directions, when the film would have certainly split with four batches of pyro otherwise.

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BERLIN INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

The award of the jurors at this Exhibition has been made, and we have just received from Dr. Vogel a list of the English contributors who have received medals, from which it will be gleaned that not only have the commissioners been extremely liberal in the number of medals distributed, but that English photographers have received signal honour. Most of the gentlemen concerned have doubtless received by this time information of the honour awarded to them, or will do so very shortly. In regard to the medal awarded to ourselves for the invention of the collodio-chloride process of printing, we feel the honour the greater inasmuch as we did not send any contributions to the Exhibition, and the award is made to the inventor on the strength of illustrations of the process contributed by resident photographers. The list of English medallists is as follows:—

H. P. Robinson (late of) Leamington—for compositions, portraits, and genre pictures.
G. Wharton Simpson—for his collodio-chloride silver process.
F. Bedford, London—for landscapes.
Vernon Heath—ditto.
Fox Talbot, Lacock Abbey—for photographic engravings.
Warren De la Rue—for astronomical photographs.
J. W. Osborne, Boston—for photo-lithographs.
Photographic and Stereoscopic Company—for photographs of statues.
John Eastman, Manchester—for beautiful dry plates.
J. W. Swan, Newcastle—for one carbon print.
J. Pouncy, Dorchester—for carbon prints.
Willis, Birmingham—for fine aniline printing process.
O. G. Rejlander, London—for studies.
Miss Cameron, Isle of Wight—ditto.
J. H. Dallmeyer, London—for portrait and triplet lenses and cameras.
P. Meagher, London—for cameras.
Ottewill, Collis and Co.—ditto.
Schade and Kistenman London—for vessels in porcelain.

Dr. Vogel resumes his report in the Exhibition as follows:—"In my last letter which was printed in the News of June 23rd, there were some typographical errors,—*e.g.* 'photography and colours' of Riccio Felice was printed instead of 'photographs in colours;' also for 'Susse Maire, of Paris,' read 'Susse Marie, of Paris;' also read 'Pretsch Process,' instead of 'Pretzjen Process,' and 'twenty-five' instead of 'five feet' of space occupied by the photographs burnt in china.

"I will now continue my report. In genre pictures, after those named before, Loescher and Petsch, with whom you have become well acquainted by the studies in pose and lighting, have exhibited the most interesting contributions. The 'Shakspeare Gallery,' by Heinrich Graf, of Berlin, is, however, still more important. He has taken a series of scenes according to life from Shakspeare's dramas. The most celebrated court-actors served him as models, and he has thus obtained pictures which, both artistically and technically, are excellent, and which manifest a thorough knowledge of the subject, as well as a true love for it. Henry IV., Falstaff, Lady Macbeth, Romeo &c., are magnificently rendered. In portraiture, Cargat of Paris distinguishes himself above all others. He has taken twenty bust pictures, half life-size, and has exhibited twenty smaller pictures, all distinguished by noble posing, a masterly illumination, and beautiful 'chiaroscuro.' After him, the Vienna efforts in portraits are the most important. Jageman, Angerer, Rabending, may be here mentioned as excellent artists. The landscape department is extraordinarily richly represented, and I only need to mention Bedford, Vernon Heath, Davanne, Bisson, Braun, to show you that the most illustrious names are here to be found. Bedford's landscapes have been made known to Germany for the first time through this Exhibition, and the public and the critics have declared their most earnest approbation for that which has been so excellently done in this department of art. A peculiar charm and enchantment rests in these pictures, which continually enrapture the beholder. Vernon Heath's pictures are also excellent, but I think that the atmosphere and sky in them are not so fine as in Bedford's.

"Davanne, of Paris, has presented our Society with a beautiful present, consisting of a series of impressions on dry plates by the Taupenot process. In comparing the dry plates obtained by Taupenot's process with the results of the most recent experiments, one must continually come to the conclusion that such fineness, delicacy, and tenderness cannot easily be obtained by any other method of dry process.

"The most beautiful tannin plate results are exhibited by the photographer of Krupp's Establishment in Essen. "They are sheets of 18 by 15, exceedingly perfect, partly developed by the alkaline method. Rousset's landscapes are excellent, and they give good indication of his artictic taste; particularly worthy of mention is his album, 'Tour de Marne.' Bisson's scenes from Mont Blanc are probably known to you. Here belong also the views of the catacombs in Paris, taken by means of magnesium and electric light by Nadar, which offer a remarkable opportunity of seeing that place of skulls, and which will have for the general public a peculiar interest. In reproductions, two firms are distinguished above all others, viz., Albert of Munich (München), and Hirsch and Nickel of Berlin. Among other things, Albert has made three collossal reproductions from oil paintings on sheets (Bristolboards) 16 by 22. These are the largest copies which I have seen in this department. Hirsch's institute has the first rank of all Berlin establishments in the field of reproductions. It (the institute) has exhibited copies of the copper-plates from Raphael photographically reproduced in their original size.

"The apparatus and chemicals remain for me to describe. Among home firms Beyrich and Schering are to be named first of all who have exhibited all the requisites of the photographer.

"Of the numerous opticians which are represented at our exhibition, I have already written you that Voigtlander, Dallmeyer, Darlot, take the most prominent part in this branch. But I consider it my duty to call attention also to some younger firms whose lenses were proved excellent by the jury at their examination, viz., Korn of Paris, who has produced some very fine portrait lenses; and Busch of Rathenow (Prussia), who has produced some excellent globe lenses, portrait lenses, and triplet lenses.

"Your countrymen excel all others in their cameras. They are the neatest and most exact mechanism in wood that have ever been seen here. The larger portion of them is sold. I have thus given you a survey of the most important things in regard to our exhibition, and in conclusion call your attention to the list of those of your countrymen who have been crowned with medals. Faithfully, yours,

"Dr. H. Vogel."

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VITRIFIED PHOTOGRAPHS.

M. Regnault has presented to the *Académie des Sciences* some specimens of a new application of photography to the purposes of stained glass windows, obtained by processes differing from those adopted by MM. Poitevin, Lafon de Carmarsac, and others, and of which the initiative is due to MM. Maréchal and Tessié du Motay. These photographs, both copies and studies from nature, are vitrified upon glass, enamel, lava, porcelain, and fayence. They vividly excited the attention of the illustrious assembly, and seemed to open a new path to the already varied applications of photography. The methods adopted to obtain these vitrified photographs, which are patented, are briefly as follows.

The processes comprehend a series of ten operations, which we proceed to describe summarily in their order.

1. Dissolve 4 parts of caoutchouc in 100 parts of benzine. To this solution add 1 part of plain collodion dissolved in ether. This compound is poured upon the material upon which we wish to produce or tranfer direct a vitrifiable photographic image; it is next dried either in the open air, or in an oven, until it forms a very adherent pellicle.

2. Upon this dried film pour the iodized collodion. This second film unites intimately with the first, and thus acquires a resistance at least equal to that of a sheet of caoutchouc of similar thickness, a resistance which no kind of collodion possesses.

3. After immersing this double film, thus prepared, in the nitrate of silver bath, we expose for the picture, either in the camera or in the printing-frame.

4. The latent image being obtained, we proceed to develop it by any of the solutions employed for that purpose.

5. The developed picture is fixed by the successive action of two baths containing in solution, the one iodo-cyanides, the other alkaline cyanides.

6. We immerse the image, thus fixed, for a few minutes in a solution of sulphate of protoxide of iron, pyrogallic acid, or any other acid that reduces salts of silver.

7. The picture is intensified by the reaction of pyrogallic acid, or gallic or formic acids, or of sulphate of protoxide of iron, upon an acid nitrate of silver solution. This intensifying requires the employment of from four to six intensifying baths for pictures intended to be viewed by reflected light, and of from twelve to fifteen baths for pictures intended to be viewed as transparencies. During this operation of intensifying, the pictures are washed at two or three different times in alternate baths, containing iodo-cyanides and alkaline cyanides in solution; then immediately afterwards in solutions of sulphate of protoxide of iron, pyrogallic acid, or any other acid that reduces the salts of silver.

The result of the consecutive employment of iodo-cyanide and alkaline baths is to effect the complete solution of the non-adherent argentic powder precipitated upon the entire surface of the picture by each intensifying bath, and this too, without destroying the primitive model which alone is thus intensified. The washings in the reducing baths, in rendering the surface of the metallized film neutral or acid anew, powerfully augments the subsequent action of the intensifying solutions.

8. The photographic picture being developed, fixed, and intensified, is immersed for one or more hours in baths either of chloride or nitrate of platinum, or in alternate baths of chloride of gold and nitrate of platinum, or in a bath of chloride of gold. During this immersion the silver of the picture is partly replaced, either by platinum, by a mixture of platinum and gold, or by gold alone. The object of these several baths substitutive of the film of silver is to vary either the colour or the nature of the picture after it becomes vitrified. For when we propose to obtain in the muffle furnace, by the action of boracic or silicic fluxes, pictures of a greenish black colour, we previously immerse the image in a bath of chloride or nitrate of platinum; when, on the contrary, we wish to obtain black pictures, we immerse them consecutively in baths of chloride of gold and nitrate of platinum. Lastly, when we desire to produce pictures in gold, we substitute exclusively baths of salts of gold.

9. The picture, on leaving the platinum or gold bath, is washed in a solution of alkaline cyanide or saturated ammonia solution: it is afterwards covered with caoutchouc or gutta-percha varnish, and submitted to the action of the muffle, which burns out the organic matters and lays bare the metals.

10. Lastly, the picture, thus freed from collodion and other organic matters, is covered with a boracic or silicic flux, and submitted to an orange red heat which vitrifies it.

Such are the several operations required in the production of these vitrified photographic pictures.

The aim, and we believe the result, of this method is to prolong the existence of the photographic picture for an indefinite period. It is a development of the principles which serve as the basis of photography in salts of silver upon paper and collodion. In that particular it differs essentially from the processes of enamelling by the chromates and persalts of iron, recently invented by M. M. Poitevin and Lafon de Carmarsac.

Practically, it is an easy application, by virtue of the employment of the combined pellicle of caoutchouc and collodion, which alone permits the submitting the picture to a great number of intensifyings and washings without being displaced or torn.

Artistically, it recommends itself generally by its multiple applications to the decoration of all silicious matters, and especially by its application to glass; for by it we obtain vitrified pictures upon this substance, visible either as transparencies or by reflected light, which hitherto were not attainable by any known photographic method.

Scientifically, it makes known the property possessed by alternate baths of alkaline cyanides and iodo-cyanides of dissolving completely—1st, the pulverulent or in completely reduced silver which constantly remains united to the metallic silver after the development and fixing of the picture, and which resists the dissolving action of the hyposulphites of ammonia, and even of alkaline cyanide baths employed alone; 2nd, of dissolving entirely the argentic precipitates non-adherent to the photographic pictures themselves, by leaving intact the metal which forms the picture, and which alone is intensified; it permits also of our proving that the pulverulent, or incompletely reduced silver, which resists the dissolving action of the hyposulphites of ammonia, and of the cyanides, as well as the non-adherent metallic precipitates engendered by the precipitation of the silver of the intensifying baths — remain partially indifferent to the substitutive action of the baths of platina and gold.

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ON REDUCING OVERPRINTED PROOFS.

BY M. CAREY LEA.*

Very little appears to have been written on this subject. Humbert de Molard proposed the use of cyanide of potassium, which last year was again brought forward as a novelty, without knowledge of the previous suggestion, by M. Faure. Some time since I myself proposed the use of iodine, expressing, however, a doubt whether so obvious an idea must not already have occurred to others. A few scattered suggestions of this sort seem to comprise all that has been published. As it will happen occasionally to all photographers to overprint proofs, the subject of the successful reduction of these to a proper intensity seems to have sufficient interest to make it worth while to write out some comparative observations made upon the above two and certain other methods of procedure which have occurred to me.

It may be as well to premise that all the following trials were made upon prints which had been toned, fixed, and washed; also that, for better comparison, prints were in some cases cut to pieces, and the different portions subjected to various treatments, and then compared both with each other and with remaining portions of the unaltered picture.

And I may further premise that these experiments clearly proved that the difficulty in reducing pictures successfully lay in this,—that the portions first attacked by any solvent are naturally the most superficial; precisely those which do most towards giving the picture its brilliancy and transparency. Consequently, there is a tendency in positives which have been overprinted and subsequently reduced, to present a more or less sunk-in and mealy appearance. The amount of this fault varies, however, very much according to the treatment which has been used for bringing about the reduction, as will be seen presently.

All the trials were made upon prints on albumenized paper.

1.—Bichromate of Potash and Chlorhydric Acid.

The experiments which I had already made upon the action of this mixture upon metallic silver satisfied me that it would prove an active reducer of positive prints. It proved, indeed, so active as to require to be used with great circumspection, and in a state of great dilution.

It was found, however, that prints treated in this manner acquired not merely a strong mealiness, but a sort of white haziness, which utterly spoiled their effect, arising, doubtless, from a production of chloride of silver, as well as a solution of a portion of the substance of the print.

2.—Iodine.

Solution of iodine prepared by dropping into water as much tincture of iodine as it would dissolve, reduced the prints very regularly and gradually, and was quite free from the fault of producing mealiness, so conspicuous in the last described method. It is not very easy to explain this difference, unless it be that the silver is first converted into the dark subiodide, and then dissolved, without the production of yellow protiodide. Some difference in the action of iodine and chlorine certainly exists.

One important caution must be mentioned. When tincture of iodine is poured into water, if the least excess is added beyond what the water readily dissolves, the excess of iodine floats in the form of a fine blackish dust, or perhaps merely a few, almost imperceptible, black specks. If these are overlooked, they will attach themselves to the print, and each one will make a small whitish spot, by dissolving out the metal. Thus the print becomes marked with small spots, either paler than the rest, or even entirely white, by which it is utterly ruined. On the other hand, if very little iodine is added, so as to make sure of its complete solution, the action of the liquid is too slow and tedious, and it becomes very quickly spent.

The best way of avoiding this difficulty is to dissolve the iodine, not in water, but in a 2-grain solution of iodide of potassium. This solution, as is well known, takes up more iodine than pure water, and its action is not detrimental to the picture.

One objection of rather a serious character exists to the use of iodine in either of these methods; it acts upon the starch with which photographic paper is mostly sized, and forms an intense blue compound. The albumen face of the picture is, to be sure, not affected, but the blue colour penetrates through the very body of the paper, and shows through the albuminous coat rendered quite transparent by the water.

The evil of the production of this iodide of starch is twofold. First, it for the time darkens the lights of the picture in such a way as greatly to increase the difficulty of judging as to the precise amount of reduction which has been effected; and, secondly, it is necessary to apply some substance of a reducing nature, to destroy the blue colour; hyposulphite of soda is, of course, the most obvious, and is what I have employed; a dilute solution produces the desired result in a few seconds. But then the print must be re-washed just as thoroughly as when first fixed; and if, after the hyposulphite destroys the blue colour of the iodide of starch, and restores the print to its natural appearance, it is found to have been insufficiently reduced, we cannot replunge it into the iodine bath until after it has been washed. The washing need not, however, be so prolonged as when the print is being finished.

3.—Cyanide of Potassium.

In the summer of 1864, M. Faure brought this method forward, having used it successfully himself. I shall first briefly state his mode of using it, and then give the results of my own trials, especially as the use of this substance appears to give better results than any other, all things considered.

M. Faure directs to dissolve five grains of cyanide in seven ounces of water. This solution reduced prints, he found, satisfactorily, except that an unfavourable influence was exerted on the tone, and a slight mealiness produced. He then added chloride of gold to the cyanide, by which these difficulties were obviated. The tone was well preserved and even improved; red pictures could be converted to black.

In repeating these experiments, I found the cyanide act very satisfactorily, and without the objections just stated. No perceptible change in the action of the cyanide solution took place when solution of chloride of gold was added to it. This was tried repeatedly, and with different proportions of gold. Both a solution of gold neutralized with carbonate of lime, and a slightly acid solution, were employed with the same results. Prints which had been toned to a slightly coppery colour were tried. Their shade was lightened by the cyanide, but no darkening in tone was perceptible from the gold which was added to it.

I do not find it very easy to account for this difference of result, or to understand how M. Faure obtained the results which I do not doubt attended his experiments. In one experiment a print was cut in half; one half placed in plain cyanide, the other in cyanide with a larger portion of gold than that directed by M. Faure. After a proper time they were taken out and washed. In the shade of colour, no change had taken place in either case; the intensity was lowered in both, but the colour was merely a lighter shade of the first; the gold solution had produced no modification in the action of the cyanide, as both halves of the print looked exactly alike.*

I found that a weaker solution of cyanide was sufficiently strong, and would recommend five grains to ten ounces of water instead of seven. The fingers should be invariably kept out of the solution. The prints should be put in, moved about, and taken out with glass rods, porcelain spoons, or platinum spatulas.

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* From the *Philadelphia Photographer*.

* Our own experiments with cyanide differ from those of our esteemed contemporary. We have generally found that with cyanide alone the colour of the print became browner, and a certain rottenness of texture was also produced. With M. Faure's modification we found the black tone and delicacy of a print unaltered, whilst its depth was satisfactorily reduced.—Ed. Photo. News.

4.—Bromide of Potassium and Bichromate of Potash.

This mixture exercises a reducing action upon prints, but leaves them cold, flat, and mealy, and cannot be in any way recommended.

5.—Chloride of Gold and Bichromate of Potash.

When to a plain neutral or faintly acid gold toning bath, a drop or two of solution of bichromate of potash is added, the mixture rapidly reduces prints. But the action is so powerful, that only the smallest quantities of bichromate can be used, and even then the action is, as in the last case, very unfavourable. The presence of the gold salt does not seem to have any favourable influence upon the operation.

The conclusion to be drawn from the foregoing is, that the substances which act most favourably in reducing over-printed positives are iodine and cyanide of potassium. Of these, the choice seems to be in favour of the cyanide. I regret that it should be so, and would prefer to see the utility of cyanide of potassium in the photographic laboratory restricted, not enlarged. But as its use seems to have certain advantages, it appears better to state them, and take the same opportunity to urge upon all who use cyanide the necessity of extreme caution with it.

THE CAOUTCHOUCOTYPE.

BY C. A. SEELY, A.M.*

The word "caoutchoucotype" is not to be found in any dictionary. This article will, however, show that it possibly may claim a place among popular words. It scarcely needs a definition. Everybody knows that caoutchouc is the original name of india-rubber, and caoutchoucotype, or caoutchocograph, must be a picture wherein india-rubber is chiefly concerned. The word was possible ten years ago, for at that time we made ambrotypes on vulcanite; but it was not peculiarly appropriate, for the rubber was simply a substitute for glass, or ferro-plates. Now I propose to apply the name to a picture which depends upon the actinic properties of india-rubber.

Vulcanized rubber is a compound of rubber and sulphur. In its manufacture the rubber and sulphur are ground up together, and the mixture then being in a plastic state, is spread on cloth or moulded in the form desired for the finished article, and finally, the mixture is vulcanized by subjecting it for several hours to a temperature of about 250°. The heat is the vulcanizing agent, which brings about the great change. Now, it has been found that light is also a vulcanizing agent, and can be and is substituted for heat, even in the practical manufacture. The raw rubber and sulphur compound, kept in the dark, is unchanged; exposed to light, it is vulcanized. Thus some of the applications to photography are made clear, and the following outlines of processes will show how to proceed:—

1. Take the ordinary raw mixture, made into sheets on cloth or paper, and expose the sheets under a negative to light. The change is not very visible, and a developer is needed. After the exposure, then, develop with ether or other solvent of raw rubber. The first effect of the developer is to penetrate and expand the unlighted parts, so as to produce a picture in relief. From this relief an electrotype may be made for printing, or casts for relief screens.

2. Treat the exposed sheet with a solvent for a moment only, when the unlighted parts become sticky. Immediately brush over the surface a black powder, and you have a picture without relief.

These processes, however, have difficulties. The ordinary mixture of rubber and sulphur is only an imperfect and impure mixture, and to produce even that very expensive machinery is required. These difficulties are overcome by dissolving the rubber with about 2 per cent. of sulphur in bisulphide of carbon, to make the consistency of thick collodion, and after filtering, if necessary, coating glass as if with collodion.

The rubber process is slow, and may be of no practical value, yet as a matter of scientific interest is worthy of this record. There is no product of the arts which has had a greater number of applications than rubber. If the Caoutchoucotype proves of practical value, the new use of rubber might be considered the climax of all others.

A NEW DEVELOPER.

BY A. B. CROCKETT.*

While experimenting on the qualities of various developing solutions with the co-operation of Prof. A. E. Verrill, we found that the following combination produced negatives superior in every respect to any other known to us; and, deeming it—if of any value whatever—of too much importance to the art to be kept merely for private and secret use, offer it to the public through your pages.

It is remarkable for working with great regularity and certainty, giving peculiar clearness and transparency in the shadows, without undue intensity in the high lights, while the development may be carried to almost any extent without danger of fogging.

The basis of this developer is a mixture of double sulphate of iron and potash with the double sulphate of iron and ammonia; but since the first-mentioned salt cannot ordinarily be obtained from the dealers, its component parts may be added separately, as in the following formula, with which we have obtained in practice excellent results:—

32 oz. of pure water, ½ oz. of sulphate of potash, ¾ oz. of protosulphate of iron, 1 oz. of the double sulphate of iron and ammonia.

To this solution add: 2 drops of ammonia, 2 oz. of acetic acid, alcohol as required. It is best to add the ingredients to the water in the same order in which they stand. The sulphate of potash should be crystallized and perfectly neutral. It can usually be obtained at ordinary drug stores sufficiently pure for the purpose.

HOW TO RECOVER SILVER AND GOLD.

BY W. H. SHERMAN.†

The following is a very simple method of saving the silver from the washings after development, and the gold from waste toning baths.

Let the developing room be provided with two sinks of equal dimensions, each of suitable size for the largest plate used in the gallery, and six or seven inches in depth, one being placed above with its bottom on a level with the top of the other. One end of the upper one may rest on the adjacent end of the lower one, thus representing the form of two broad steps.

Insert through an orifice about an inch from the top of the upper sink a piece of half-inch india-rubber pipe, fifteen inches in length, bending down the end *inside* the sink to within an inch of the bottom, and letting the end *outside* hang down over the lower sink. The part of this outside should be longer and reach lower than the part inside, thereby forming a syphon, and the orifice through which the pipe passes should be tightly closed with melted gutta-percha or wax.

Now, having a water-cock over each sink, and a waste-pipe from the lower one, let the impressions be developed and the silver rinsed off from both sides of the plate into the upper sink with as little water as will just answer the purpose, leaving the thorough rinsings to be done in the lower sink. The film of rejected negatives may be washed off, and the waste toning baths may also be emptied into the upper sink. The iron of the developing solution continually added to this sink will precipitate the silver, and, moreover, with the aid of the acetic acid, and perhaps the alcohol, effectually precipitate the gold from the waste toning baths.

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* From the *American Journal of Photography.*

* From *Humphrey's Journal.*

† From the *American Journal of Photography.*

Whenever this sink becomes filled to the top of the syphon, the water which it contains will very quietly flow out of its own accord, leaving the sediment behind, undisturbed, on the bottom of the sink, where it may remain until it has accumulated so as nearly to reach the end of the syphon, when it may be removed to a jar kept for the purpose.

It may be unnecessary to add that washings from the cyanide and hyposulphite baths should be kept out of this sink, as they would only redissolve some of the precipitated silver and gold.

I have used this contrivance for more than a year, and have been so well pleased with the proceeds thereof that I am sure such of your readers as may have occasion to use it will thank you for publishing this description. Those who have not heretofore saved the wastes above referred to, will, by trying the experiment of saving them, be surprised at the amount they have been throwing away.

RULES FOR DRY-PLATE PHOTOGRAPHERS.

[We select the following half-score of rules from "Practical Photography on Glass and Paper, Part II." Negretti and Zambra. We commend them to the attention of all who work dry plates.—Ed.]

I. Select your glass with care; always using, for dry processes, good thin patent plate.

II. Always use new glasses, reserving those which have been once used for the wet process, in which you see your results at once. There is always some uncertainty about glasses which have once been used.

III. Grind your glasses at the edges, and clean them with scrupulous care. Use a broad camel-hair pencil to remove any dust the last thing before coating with collodion.

IV. Use a pneumatic holder for sustaining the plate, so that it may be as little handled as possible. This will also allow the plate to be covered up to every corner, and lessen the liability of the film leaving the glass during any portion of the operations.

V. Let the first washing water, after the plate leaves the nitrate bath, always be distilled, and the last also where a final wash is directed. If you have facilities for so doing, always wash in a series of vertical baths, say half-a-dozen, in which case it will never be necessary to touch the plate with the fingers whilst washing, the plate being retained on the same dipper throughout.

VI. Except where the bath or collodion requires special conditions for the process, always see that they are such as work cleanly and satisfactorily in the wet process, before commencing the preparation of the plates.

VII. Always try one of a batch of plates before trusting them for important work at a distance.

VIII. Always pack dry plates so that they shall be impervious to air and moisture as well as to light.

IX. Never under-expose dry plates. It is easy by management in developing to produce a good negative from an over-exposed dry plate; but it is impossible to secure thoroughly good results from an under-exposed plate. It is a good maxim to expose for the deepest shadows; the lights in such case will rarely suffer.

X. As a rule, develop slowly, using very little silver at first. If the plate shows signs of over-exposure, then, by adding silver quickly, and stopping the development quickly, a good picture may be secured; but if the exposure be right, slow development will give the finest negative. If signs of under-exposure appear, then very slow development, and the use of very little silver, will largely remedy the defect. In all cases avoid over-intensifying, as the colour of most dry plates is non-actinic, and a thin deposit will often resist light vigorously in printing.

THE PHOTOGRAPHER IN THE HANDS OF BRIGANDS.

All photographers must read with interest the details relating to the detention of an able amateur photographer by brigands, seized in open day in the pursuit of his favourite art, within a few miles of the residence of representative of the British Government. From the details obtained from various sources, which follow, it will be seen that the case of Mr. Moens is most destressing and well-nigh hopeless. The *Pall Mall Gazette* says:—

> The latest news of Mr. Moens, the captive still in the hands of the brigands, is contained in a letter written by himself on the 29th of June, in which he describes his sufferings and the threats held out by his captors to enforce the speedy payment of more money. We can only trust (says a friend of Mr. Moens who writes from Salerno) that these wild men, knowing their prisoner's friends are exerting themselves to the utmost to pay the money and to mitigate the severe measures taken by the military authorities, will refrain from carrying into execution the awful threats which they have uttered from time to time. But, apart from this, the most terrible dangers of his position, the miseries and hardships which Mr. Moens has undergone during the last seven weeks are sufficient of themselves to cause the deepest anxiety to his friends should his captivity be much further prolonged. The sum originally demanded for the ransom of Mr. Moens and his friend was 50,000 ducats, or 8,500*l*. It was settled between the captives by lot that Mr. Aynsley should go to get the ransom, Mr. Moens remaining as hostage in the hands of the brigands. The Italian Government has been making the most strenuous exertions to capture the brigands, or to starve them into surrender, but they as yet continue to baffle their pursuers. At the same time, the severe measures resorted to by the military and civil authorities in the province of Salerno have placed immense difficulties in the way of Mr. Moens's friends communicating with his captors. Notwithstanding those difficulties, however, Mr. Moens's friends have succeeded in paying a large sum of money to the brigands, who still hold out for the sum originally demanded, and they now seek another opportunity of paying such further sum as it is in their power to pay. The money has to be paid in gold, at the time and place appointed by the brigands. Their messenger can only carry a certain amount, and he has to pass through the *cordon* of troops surrounding the district at the risk of his life. The brigands themselves are frequently unable to meet their messenger, owing to the vigilance of the troops; and, when so baffled, they generally disappear from the neighbourhood for a fortnight or so, after which nothing can be done till they make another appointment.

The sum demanded is, we understand from good authority, £10,000, not £8,500. It appears that the original rumours to the effect that the brigand into whose hands Mr. Moens had fallen was Giardullo (subsequently stated to have been taken) is an error; Manzo is the chief's name, and his band, with recent additions, consists of forty persons only, of whom five are women; and these men elude or defy all the troops sent by the Italian Government in pursuit! The following letter from Mrs. Moens, addressed to the morning papers, gives additional point to the hardness of the case every way:—

> Sir,—My husband has now been two months in the hands of the brigands, and his restoration to me seems more hopeless, or at least more remote, than it did in the middle of May. I then thought he would either be at once released by the troops, or else be set free on payment of a ransom. But it now seems that the soldiers cannot release him, although they number 6,000 men in this province alone. I think, then, that I have cause to complain that they will not allow me to attempt to ransom him. I can now send neither money nor letters to the brigands, as no person will dare to go to them without a pass from the general, and this is refused me. My husband is in a far worse position than any Italians have been who have been captured at various times in this province, for their friends were allowed to negotiate with the brigands.
>
> I know that it is irregular and illegal to connive at brigandage, and to allow brigands to receive ransoms; yet these things have regularly been permitted by the Italian Government in Southern Italy, up to the date of my husband's capture. Had this not been the case brigandage could not have flourished as it has done, and my husband would not have been captured. Besides, if it be irregular and illegal that the Government should connive at brigandage, it is still more irregular that they should permit peaceful travellers to be carried off by bands of armed men. My husband and I were travelling—in perfect confidence in the strength of the Italian Government—along a road which we were

assured was perfectly safe. Though the authorities at Salerno knew that it had become unsafe within the few previous days, and that the brigands were then in the plains of Pœstum, they neither warned us of our danger nor afforded us any protection against it.

If the Italian Government be now really in earnest to put down brigandage, I only wish they would allow my husband to escape before they put in execution their new, strict, and severe measures. It would be far better for him if they would continue to show their former nonchalance and supineness. It is very cruel that because he is an Englishman he should fall a victim to a severity which has never been shown when Italians have been captured by the brigands.

I trust to your kindness to insert this letter in your powerful paper, that my unhappy position may be made known to my countrymen.—I am, sir, yours, &c., Annie Moens.

Hotel Vittoria, Salerno, July 12.

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Proceedings of Societies.

Amateur Photographic Association.

A Council Meeting of this Association was held the 23rd ult. at 12, York-place, Portman-square, James Glaisher, Esq., F.R.S., in the chair; the minutes of the last meeting having been read and confirmed, the following members and subscribers were proposed and elected:—

E. T. Castle, Esq.; T. Letts, Esq.; Mon. F. Proeschel, (Pere); F. Moser, Esq.; H. Cooper, Esq., jun.; Miss Caroline Powell; H. V. Cholmondeley, Esq.; W. H. Simpson, Esq.; Capt. H. St. T. Dick; A. Turpey, Esq.; Wm. Sandy, Esq.; E. H. Clarke, Esq.; Lady L. Dutton; G. A. Musgrove, Esq.; F. R. Griffith, Esq.; W. B. Marshall, Esq.; the Hon. A. L. Ruthven; Rev. W. B. Beaumont; W. S. T. Sinclair, Esq.; Rev. Alfred Smith.

The Chairman then laid before the meeting for their consideration a revised copy of the rules, in conformity to a request which had been made to him at the preceding meeting; and after a lengthened discussion, such alterations and additions were made in the rules as the Council considered suited to the growth and prosperity of the Association, the radical alterations made in the rules being the withdrawal of the commercial element from the Association; the doubling the amount to be bestowed each year in prizes; and the withdrawal of Rule 10, it being found by experience that the money received under this rule would have been preferred in the shape of prizes. The secretary was directed to have the rules as revised at once printed, and a copy sent to every member. The proceedings then terminated. A. J. Melhuish, *Hon. Sec.*

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Correspondence.

FOREIGN SCIENCE.

[from our special correspondent.]

Paris, July 19th, 1865.

Messrs. Maréchal and Tessié du Motay communicated to the last meeting of the French Photographic Society the paper of which I gave you a summary in my last letter. M. Léon Vidal sent also the photometric tables that you are already acquainted with. At the same meeting M. Meynier, of Marseilles, communicated the improvements he has introduced into the manufacture of sulpho-cyanide of ammonium. Thanks to these improvements, that salt may now be sold at 2 francs the kilogramme wholesale, and 2fr. 50c. retail. He hopes that this diminution will lead photographers to definitely abandon cyanide of potassium, which is so dangerous, and hyposulphite, the principal cause of the deterioration of the image. He insisted on the results of the experiments already made, and he said that if there had been deceptions, they must be laid to the account of defective manipulation. To fix negative pictures on glass with sulpho-cyanide, a saturated solution is necessary. The image is plunged into a cuvette filled with a bath containing 100 parts of this salt to 100 parts of water. This bath is employed as it is till it is all used up, it being merely necessary to replace what is taken away by each picture. For positive pictures upon paper, the solution must be at 35 per cent., and should be rendered slightly alkaline by the addition of 2 or 3 cubic centimetres of ammoniac per litre. In all cases the pictures must be fixed twice. Thus negatives are plunged at first into the bath of sulpho-cyanide, and as soon as the milky aspect has disappeared, they are washed, then they are again plunged into the same bath, and, finally, again washed. The positive picture on paper is put, after the toning, into a cuvette full of a 35 per cent. solution, where it remains for about ten minutes. When that time has elapsed, it is rinsed in a little water, and then put into a second cuvette, full also of sulpho-cyanide of ammonium at 35 per cent., where it must remain five minutes, after which it is withdrawn, to be submitted to a methodical washing. When the first cuvette no longer fixes, the solution is thrown with the residues, so that the silver it contains may be withdrawn, and the second becomes the first, while a new solution is prepared for the second bath. In this manner the use of sulpho-cyanide becomes as economical as that of hyposulphite of soda, which cannot properly serve more than once.

M. Meynier also communicated an ammoniacal nitrate of silver, which is, he says, more economical than simple nitrate, and gives finer pictures. This salt must be perfectly crystallized and very pure, in order to give such results. It is employed as ordinary simple nitrate. For negative pictures these must be added to two or three drops of acetic acid per 100 cubic centimetres, and for positive pictures it is, on the contrary, rendered slightly alkaline with a few drops of ammoniac.

Messrs. Geymet and Alker likewise described the formula of an economical silver bath. Instead of 15 or 20 per cent. of silver, the proportion is reduced to 5. The formula is as follows:—

Grey nitrate of silver ...	4 or 5	grammes
Water	100	"
Alcohol	5	cubic centimetres
Ether	5	" "
Liquid ammonia ...	2	" "

To this are added six or eight drops of sulphuric acid, and then it is filtered. With this bath a shorter exposure suffices.

The same gentlemen also presented some pictures obtained upon mirror-glasses, and which are transparent by transmission and invisible by reflection. The image may be obtained direct or by transfer, with the help of the ordinary processes. The mirror bearing the picture is mounted upon an opaque movable ground, and may serve for the toilet; but when the back is taken out and the mirror is placed before the window, for instance, then the image is perfectly visible.

Lastly, M. Descamps presented a series of very fine pictures, amplified by means of Dr. H. Van Monckhoven's dialytic apparatus in a few minutes, and from carte de visites obtained with Ross's objective No. 2.

M. Lodovico de Courten sends me some interesting observations on the application of the preliminary layer of gelatine in Major Russell's tannin process.

The solution of gelatine (composed in M. de Courten's practices of 1 gramme of gelatine to 100 of water) with a few drops of acetic acid in it has always been difficult to spread over the glass; the glass seems to repel the solution, especially at the edges, as it would do if unctuous, although it has been most carefully cleaned.

Thinking that this arose from the humidity lodged in the pores of the glass, M. de Courten warmed it to a temperature of about fifty degrees centigrade; but the glass continued to repel the liquid.

Might not this be an electrical phenomenon (he asks), especially as the repulsion is strongest at the edges, which have most been rubbed? Further, the liquid spreads over the glass perfectly, if it is left in repose for a quarter of an hour after thé cleaning.

Our correspondent has, however, thought that he has observed that the inconvenience is more persistent when the acid is employed in the solution. He has, therefore, eliminated it. The gelatine remains pretty clear, and spreads well, if the precaution already indicated is attended to. He also avoids the use of alcohol.

As to the mode of development best fitted to this process, it is, according to M. de Courten, the levelling method indicated in Messrs. Barreswill and Davanne's excellent work. In this way you avoid all mottling, and roughness and muddy deposits, and the image comes out in a very uniform manner. This method is, besides, easy and clean in its manipulation.

The glass is first plunged into a bath of distilled water, not for the purpose of dissolving the tannin, but that the developer may act everywhere and uniformly. The glass is then laid upon the developing solution with the collodionized face downwards, and is held up so as not to come into contact with the bottom of the cuvette.

In most cases the following solution seems sufficient:—One decigramme of pyrogallic acid, 2 cubic centimetres of acetic acid, and 30 of distilled water, to which are added 6 or 8 drops of another solution, containing 4 parts nitrate of silver to 100 parts distilled water.

It is well to mention here that this levelling method is not suited to the *sensitizing* of glasses coated with gelatine. It nearly always happens that the thickest part of the collodion, which is at the edges, sticks to the bottom of the cuvette; then, in raising the hook which sustains the glass, an irremediable rent is made; sometimes a large portion of the collodionized coating is torn away from the glass. The cuvettes *à recouvrement* are most serviceable; they are even to be preferred to vertical cuvettes, which require considerable quantities of bath. Besides, when once the coating has been covered with tannin, it acquires great tenacity, and it is rare for any small fragments to be detached from it.

"A judicious application of Major Russell's processes," adds our correspondent, "enlightened observation, and, lastly, experience, will supply the best rules to be followed in this method, which surpasses all preceding methods in beauty, in facility, and in uniformity of results."

Ernest Lacan.

PANTASCOPIC CAMERA.

Sir,—In accordance with the desire intimated in the concluding sentence of your note to my letter of the 30th of June, I beg to furnish you with some details of the practical shape of my curved plate pantascopic camera.

Fig. 1

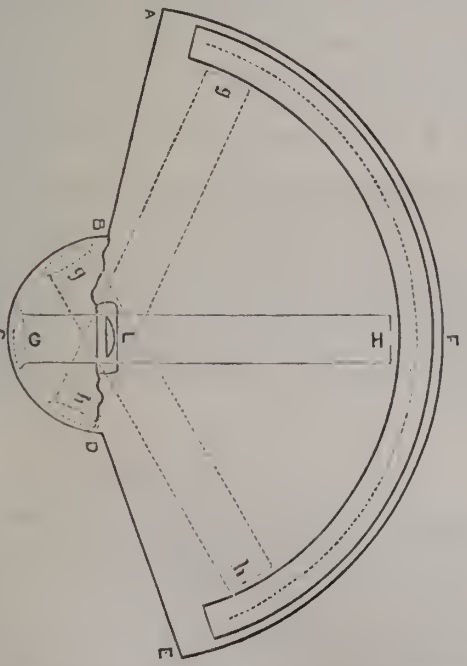

Fig. 1 represents the horizontal section of the instrument. The lines A, B, C, D, E, F, A, show the form of the base and top boards of the camera. The curved side E, F, A, may be made of japanned tin, or ebonite, &c. &c., and so also may the curved portions of the plate-holder, and a cover for the lens, &c., extending from the lower to the upper boards at the portion B, C, D.

The inner segments indicate the form and position of the dark slide, whilst the dotted one between them shows the position occupied by the flexible plate. The optical centre of the lens L is coincident with the centre from which the curves are described, and upon this centre it revolves, carrying with it the light metallic chamber G H, which limits the exposure to a small portion of the plate at a time.

The revolving box in which the lens is situated is connected by bands of loose india-rubber cloth with the portions B and D, whereby we prevent the entrance of extraneous rays without interfering with the motions of the lens, &c.

Fig. 2.

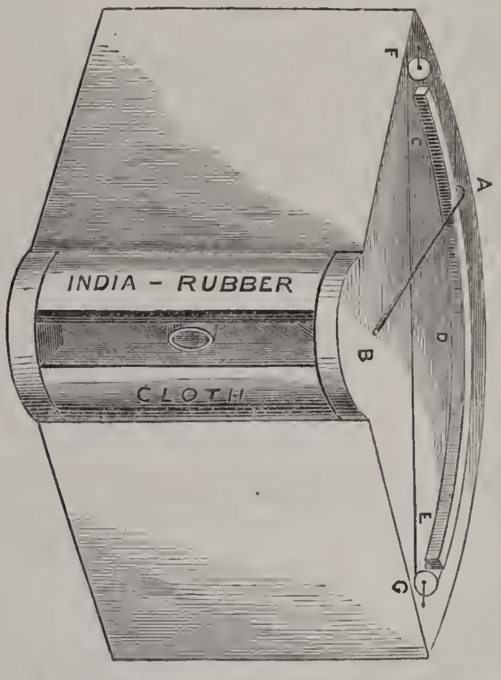

Fig. 2 represents the vertical elevation of the instrument as seen from the front.

An arrangement for producing the motion of the lens may be seen upon the top. A B is a lever proceeding from the centre, upon which the lens turns. The curved ridge C D E is made of any of "the thousand and one" suitable materials at hand, and projects, say half an inch above the top of the camera.

At each end of this ridge there is a small metallic or other pulley (F and G).

An endless band of india-rubber or other thread, fastened in one part to the lever A B, passes from one pulley to the other round by the outer smooth edge of the ridge C, D, E, returning under the lever A B. When either of the pulleys is turned round by a handle provided for the purpose, the endless band draws the lever along its course, and thereby causes the lens to describe its partial revolution. It will require but little skill to produce an equable motion by this means, and obtain "fine atmospheric effect." The rate of motion may be varied by varying the speed of the revolutions, or by using conical or multiple pulleys.

If an automatic movement is desired, it may be produced by any of the number of means which will at once suggest themselves, such as clockwork, falling mercury, a tapering spring, &c. &c.

To use this instrument, the flexible plate is cleaned in the proper manner, collodionized, and sensitized. One end is then introduced into a slide, or beneath a spring prepared for it in the plate-holder; the plate is then curved round the edge made for it, and secured at the other end by a spring. It is then introduced into the camera (which is permanently focussed), the front shutter is raised, and the lens caused to revolve at the required speed. After thus taking the picture, the plate is of course unbent and removed.

If it is too thin to sustain itself flat without support, it may be caused to adhere to a glass plate by a drop or two of moisture, and then developed. If the plate is non-transparent, it will require to be transferred before intensification to a transparent material (glass). Such is a brief sketch of my camera and its mode of working.

Next, as to Mr. Johnson's uncalled-for letter. I say uncalled-for, because his second paragraph (which is the only one he need have written), though made up of English words, exhibits such an "eccentric" variety of English grammar, that I do not think it conveys any legitimate meaning at all, except it be that Mr. Johnson uses talc in making out a specification. His third, fifth, and last paragraphs are un-called-for, because they contain little or nothing besides the positive (and perhaps erroneous) statements of "a self-constituted judge" of photographic possibilities and expenses, together with a few sketches of his private actions and intentions, and some scraps of unpaid-for advertisements.

The fourth paragraph is uncalled-for, because in it he makes a quotation from a sentence which never appeared in your columns at all, with the confidence of a man who knew it did, and in reference to which sentence the whole of that paragraph is written.

I fear I have already intruded sufficiently upon your space for one letter, and hence will postpone until next week my answer *in extenso* to Mr. Johuson's communications.—I am, sir, your obedient servant,

X. Z. C. H. K. &c. &c.

Sir,—Having seen the letters of your correspondent "H. C. Z." in last week's News respecting a new form of pantascopic camera, I beg to say that Mr. Wm. Fletcher, of Bradford, made a camera some three months ago, circular in form, and which will take pictures extending three quarters round a circle. The chief aim is to take pictures 12 inches by 4½ inches on a continuous surface, registering each length of sensitised material as it is exposed, by which means the camera may be used either for the wet or dry process. The only difficulty Mr. Fletcher has found is the proper substance upon which to take the views, as "mica" is not easy to get in lengths sufficient for his purpose. I believe he is now turning his attention to "sheet gelatine," with the object of rendering it impervious to water, so that it may bear the different processes of development.

If any of your readers could suggest to Mr. Fletcher a substance which would answer his requirements, no doubt he would be very glad to hear from them through your journal.—I am, sir, yours, &c., J. P. Macfarlane.

ON VITRIFIED PHOTOGRAPHS.

Sir,—In your number for July 7th, and also in the number of the *Photographic Journal* for July, dated the 15th inst., there is an account of a process of Vitrified Photographs, lately brought before the Académie des Sciences, at Paris, in respect of which I feel it incumbent on me to ask your permission to say a few words.

The public who follow with marked interest the gradual development of the photographic art, might be misled by a statement which occurs in the printed report above alluded to, saying, "that the inventors, Messrs. Maréchal and Tessié du Motay, have obtained vitrified images, visible either by reflection or transparence which, hitherto, have not been produced by any known scientific method."

Mr. Maréchal is very advantageously known, already, as the son and pupil of one of the best artists of modern times, as a glass painter, and his assertion, quoted above, was doubtless made *boná fide*, and in ignorance of the fact that I obtained in this country, five years ago, a patent for the production of precisely the same kind of pictures or images, to be viewed either by transparent or reflected light. Various specimens of the invention, in monochromes of divers colours and sizes, from medallion size up to twenty inches in proportion, were exhibited publicly by me at one of the meetings of Society of Arts, in the same year, on the occasion of my reading a paper descriptive of the invention, the results of which are simple, practicable, and especially rapid, and I was honoured by the Council of the Society awarding to me their silver medal.

It must appear to anyone at all conversant with the subject that by the process of Messieurs Maréchal and Tessié, ingenious as it is doubtless, a considerable expenditure of both time and money is necessary to produce any picture; and unfortunately, the age we live in requires imperatively, not only rapidity of execution, but cheapness also, as a condition, *sine qua non* of success, or merely to satisfy the growing public demand.

The respective merits of either invention I would gladly leave to the decision of those who may feel inclined to try both processes with care and attention, but I distinctly enter my protest against Messrs. Maréchal and Tessié having any priority in producing "Vitrifiable Photographs or other images either for transparent or reflected light," and I claim it for myself without hesitation. The pages of your estimable Journal would, if needed, furnish the proof of my assertion, as you printed part of my specifications at the time, accompanied with some favourable editorial remarks I remain, sir, yours, &c., F. Joubert.

36, *Porchester Terrace.*

[On another page we give fuller details of the process in question, a *résumé* of which appeared in the letter of our Paris Correspondent a fortnight ago. The excellence of the process appears vouched by high authority, but we must confess that the method of obtaining results appears excessively complicated and tedious, and not to be compared to that of M. Joubert in simplicity. We have not as yet had opportunity of comparing them for excellence of result, but we have already expressed our high opinion of those of Mr. Joubert, especially as recently improved.—Ed.]

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Photographic Notes and Queries.

Sayce's Collodio-Bromide of Silver.

Sir,—I have made some short experiments with the process of Mr. Sayce of Liverpool. I find the alkaline pyro developer of Major Russell more powerful on a wet plate than the protosulphate of iron; it works clean and brings out the shadows with a shorter exposure. The image is very weak, but intensifies readily with pyro, silver, and formic acid.—I am, sir, yours, &c., J. Thompson.

Market Drayton, 17th July 1865.

Diamond Cameos.—Caution to Photographers.

Sir,—We beg you will favour us with a small space in your Journal, to warn photographers against an error into which they are likely to be led by the mis-statements of tradesmen. A dealer, we hear from several correspondents, is offering lithographic cards with oval spaces for cameo portraits, having one, two, three, and four heads on each card, the last in the "Diamond Cameo" design, and photographers are told that this design may be used *and embossed* without regard to our registration rights for "Diamond Cameos." We are anxious that photographers should be made aware that this is not the case; as, for the protection of our licenses, we shall feel ourselves obliged to proceed legally against any persons infringing our copyright. Should this notice not prove sufficient, we shall be under the necessity of giving the dealer's name, and so more explicitly warning photographers against his representations.

We have not any claim to any design whatever, unless it be embossed, and only to the design of the Diamond Cameo.—Your obedient servants, WINDOW AND BRIDGE.

63A, *Baker-street*, 13*th July*.

PHOTO-BINOGRAPHY.

SIR,—In reference to Mr. Edwin Pettitt's last communication, I beg to assure him that he is in error as to the cause of my silence. I have carefully read his letters, and remain of my original conviction, that he is wrong in his ideas of stereoscopic vision.

As the philosophy of the Stereoscope has been so satisfactorily established, I have thought that no useful purpose could be gained by re-discussing its first principles. I have therefore refrained, and wish to refrain, from continuing this controversy. I write these few lines, however, to prevent my silence being misconstrued.—Yours truly, JABEZ HUGHES.

PHOTO-BINOGRAPHS.

SIR,—To my astonishment I noticed in the last copy of the NEWS a letter from Mr. Pettitt on the subject of his so-called binographs, in which he concludes that as Mr. Hughes, Mr. Reeves, and others are silent on the subject, his strange fallacy (to call it by no stronger term) is by them admitted to be an acknowledged fact.

Now, although to a certain number of photographers the fallacy into which Mr. Pettitt has fallen is but too evident, yet to the greatest part, not possessing any great amount of scientific knowledge, the letter alluded to would leave them under the impression (if not contradicted) that it was possible to give to a *single* picture stereoscopic relief.

Unfortunately, I have not the copy of the NEWS at hand that contains the report of the meeting where Mr. Pettitt's paper was first read. But if my memory does not deceive me, to the greater part (if not all) of the members present the pictures shown by him, as produced by his method, appeared only remarkable for their woolliness and want of sharpness (which, as all photographers know, can be obtained by a much shorter method than Mr. Pettitt's). That fact alone ought to convince him that, though to his eyes the pictures are in relief, they to every one else's are nothing but flat paper.

To one remark of Mr. Pettitt's I quite agree; that is, that it would be better to appoint a committee of scientific men to report on Mr. Pettitt's *tub* (as he terms it), and if they state that they find its *bottom* sound, no one will be more eager to acknowledge Mr. Pettitt's claim than—Yours respectfully,

Scarborough, Saturday. J. C.

[We must do Mr. Pettitt the justice to state that the enlargement exhibited at the meeting as a photo-binograph was infinitely superior in gradation and modelling to that exhibited as a print from one negative of the pair. We think it must be evident to everyone that only an illusionary effect of relief can possibly be rendered on a plane surface, entirely distinct from that relief resulting from binocular vision; but in the specimen exhibited by Mr. Pettitt, the illusion was effective; the picture was not sharp, but it was free from a certain wiry hardness too common in enlargements. We were unable, however, to perceive the effect of solidity which Mr. Pettitt fancied it possessed.—ED.]

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Talk in the Studio.

NEW PROCESS IN PHOTOGRAPHY WITHOUT THE AID OF LIGHT.—Mr. Hodgson, photographer, Bank-street, writes us:—"Last October, the *Illustrated London News* issued a picture, along with the paper, of the 'Kingfisher's Haunt.' Having no use for it, I put the picture in a drawer, betwixt two sheets of paper, prepared for enlarged photographs. The paper is prepared with 400 grains of isinglass, 440 grains of iodide of potassium, 146 grains of bromide of potassium, and 54 grains of chloride of sodium, to 40 ounces of water. This paper is quite insensitive to light; but what was my astonishment, on looking in the drawer last Tuesday, to find the paper on the top of the picture a negative, the sheet underneath a fine positive, the light greens and blues coming white, and the reds coming red, in the positive. Those pictures I hung in the light for two days, and they faded away. One sheet I have put under again, and several quires of blot-paper on the top, and another positive is printing on the same paper, which I hope to be able to fix.—*Sheffield Independent.*

IMPROVEMENT IN THE ELECTRIC LIGHT.—M. Duchemin not long since announced to the Academy of Sciences that in a Bunsen's battery the nitric acid could be replaced by perchloride of iron, and the sulphuric acid by a solution of common salt. He has now stated that by substituting crude chloride of potassium for the common salt, the electro-motive force of this battery is increased, and its calorific effects intensified; the electric light being easily produced when the chloride of potassium is employed instead of chloride of sodium.

HOW TO USE UP OLD BATHS AND SAVE THE SILVER.—Mr. Billinghurst writes to the *American Journal of Photography* as follows:—For several months past I have been using an old silver bath for silvering albumen paper. It had been used a long time, and was in such a condition that it would not work without considerable trouble; so I added pure water sufficient to precipitate the iodide; then, after filtering, I added silver in crystals until the solution was strong enough for silvering paper; then a sufficient quantity of aqua ammonia. It seems to give as good results as to use the crystals. There is more economy in this process than in "doctoring up" an old bath, for anyone who makes photographs uses more silver for silvering paper than for any other purpose, and by this process old baths that "will not work" can be used up. If you think this information will be of any advantage to the readers of the *Journal*, you may publish it. It may be nothing new to them, though I do not know of anyone who has ever tried it but myself.

PARIS GREAT EXHIBITION OF 1867.—It is said that the Champ de Mars has been definitely decided on for the locality of the next great International Exhibition, and that the preparatory works will be commenced on the 16th of August, the day after that of the Imperial fête. The building to be erected there will, however, only contain the industrial portion of the Exhibition; the fine arts will be represented in the Palais de l'Industrie, in the Champs Elysées, on the opposite bank of the Seine, where the annual *salons* or exhibitions of the works of living artists are now held. It is anticipated that a very complete display of photographs from all parts will be exhibited.

TAKING PORTRAITS IN THE DARK.—A contemporary says:—"Somebody has found out a new way of taking pictures, by which they can be taken better in the night than in the daytime. A photographer has missed several from the frames that hang by his door, and doesn't approve of the new plan."

NITRO-BENZOLE AS A POISON.—In a recent inquiry regarding the sale of poisons before a select committee of the House of Commons, Professor Taylor gives the following evidence as to the toxical effects of nitro-benzole, whether benzole as it is chiefly used by photographers before it has been heated with nitric acid is equally dangerous is not stated. "I now come to another article; and that is a substance only recently discovered, or comparatively recently discovered, and which is now largely used with reference to the aniline dyes—nitro-benzole. It is a very powerful poison in some respects. It has some of the character or smell of the oil of bitter almonds. I had a case of poisoning with it lately referred to me. It was sold for the purpose of giving a flavour to confectionery, and it acted so quickly on the person who took a small quantity that he died a short time after. The difficulty about this poison is this—a person may take it and appear to be well for some hours as if nothing was the matter with him. There was a coachman who went into the kitchen where the cook used this in place of oil of bitter almonds for flavouring pastry, and, after tasting it, he did not appear to suffer any ill effects. The man jumped on the coach-box and took his master for a drive. It was only on returning home some time after he had tasted this liquid that he felt very ill, and he soon died. This liquid would not probably get into common use, because it could not be given to a person without his knowledge, as it has a peculiar smell. It is a dangerous substance to be allowed to be kept by uneducated persons. I cannot see my way exactly between fettering commercial liberty in obtaining a thing like this in quantities for manufacturing, and at the same time protecting life. I do not wish to fetter commerce. It has been a result of my practice to see a large number of deaths from poison, and I am more impressed with the necessity of seeing something done to prevent these deaths from occurring."

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To Correspondents.

Camera.—With a well-lighted and properly-exposed landscape there should be no difficulty in getting the sky quite as dense as it ought to be, provided the chemicals are in proper order. Indeed, one of the chief difficulties in landscape work is to prevent the sky becoming so dense that it prints white, if the remainder of the subject be sufficiently intensified. If yours are so much too thin, it is suggestive either of over-exposure or of something wrong in your chemicals. It is quite possible to intensify the sky a little more than the foreground, but it should not be necessary. The best condition for the sky of a landscape negative is that it should just print to a slight tint when the rest of the picture is sufficiently done. Some of our ablest landscape photographers take advantage of this slight printing through to paint clouds, at the back of the negative, which are just a trace lighter than the sky. In cases where the sky is a little too dark, tracing paper carefully cut to the form of the horizon may be attached to the back of the negative, and, if skill be used, very fine cloud effects produced therewith.

A Constant Subscriber (Derby) will find the names and addresses of the best camera-makers in our advertising pages. The addresses of both Meagher, and Ottewill, or Ottewill, Collis, and Co., as the firm now stands, will be found there.

One in the Dark.—In the preservative process described by Mr. Blanchard the filtered solution should be quite clear and not quite so thick as glycerine, and the solution should be flowed backwards and forwards on the plate until it mix perfectly with the free nitrate there, then poured off and another portion applied and treated the same way. The most frequent cause of failure is the use of a nitrate bath containing some trace of nitric acid instead of acetic acid as directed. It is possible, with proper precaution, to keep an ordinary wet plate for half an hour without injury. It is necessary, in the first place, that the bath be in good condition and free from organic matter. If the plan of using two baths, which we recommended some time ago, be adopted, the result will probably be better. A piece of damp blotting-paper should be placed at the back of the plate, which should rest on pieces of damp blotting-paper at the corners. Some photographers use for long exposures a bath containing a little lump sugar in solution, but this renders it more apt to get out of order.

J. Arkaight.—If you read our answer again you will find that we recommended you to increase the amount of glass in your room, not to decrease it; but we also recommended that the top light should be carried a little forward altogether, as it is too directly vertical. The amount which should be opaque over-head will vary with circumstances, but three feet are insufficient; we should prefer at least five feet. If you have sufficient light on the shadowed side without reflectors, do not use them; but having an objection to reflectors is not a good excuse for permitting your portraits to have heavy, black shadows without detail. We prefer side lights carried to the floor, or nearly so. 2. The pyroxyline you describe is unfit alike for Mr. Sayce's process or our own. It is probable that it has been made with too weak acids, and at a low temperature. We regret that we cannot tell you where to buy good pyroxyline. As a rule collodion makers do not care to sell pyroxyline. The preparation of it is a troublesome operation, and the demand for it not so great as to render it an article of trade worth pushing. 3. It is best to add silver regularly at the rate of not less than 30 grains for each sheet of paper which has been excited. The print you enclose is excellent. 4. We believe that Mr. Sayce will supply the prepared material. Write to him at 13, South Castle Street, Liverpool.

An Amateur.—The article which appeared in the News upwards of twelve months ago was reprinted from a contemporary, but there is an evident misprint; for nitric acid, read citric acid, in the second solution.

B. P.—Either a good quarter-plate or half-plate may be used for enlarging from 6 by 4 to 10 by 8. We have had no experience with the lens you mention.

A Country Photographer.—The chief fault in the picture you enclose arises from under-exposure in the negative.

Preston.—The only mode in which you can ascertain satisfactorily whether a picture is registered consists in examining the Registrar's list at Stationers' Hall, which you can do on payment of a small fee. 2. You cannot register any picture after copies of it have been circulated.

H. J. Duly.—The albumen solution, if kept well corked, will keep some weeks in hot weather or months in cold weather longer. 2. The albumenized collodio-albumen plate can be kept for some months, and is rendered sensitive when required for use. It will keep sensitive for a few weeks without deterioration. 3. The exposure should be from 8 to 12 times longer than for wet plates by iron development. 4. They may be developed two or three weeks after exposure, but the sooner they are developed the better. 5. The process is an exceedingly good one. We cannot undertake to answer such enquiries by private letter.

G. R. B.—The "Tired Soldier" would be very good but for the defective definition. The card picture has many excellent qualities, and is above the average in quality. The lens seems a good one. It is a pity such a foolish competition and tendency to low prices exists in your town. It is very suicidal, and never issues in good to any one.

A Bungler.—It is most probable that you do not allow the plate to remain long enough in the bath to allow the whole of the bromide to be converted into bromide of silver. We will, however, make some enquiry and recur to the case again.

J. B. R.—The chief cause of the dull, poor tone of the print appears to be lack of vigour and brilliancy in the negative. Unless a negative have sufficient intensity and contrast it is impossible to obtain brilliant or fine toned prints. Possibly this may be a highly salted sample of paper, and may therefore require a stronger bath than you are using; of this of course we cannot be certain, but throw out the suggestion. The paper appears to be remarkably free from defects.

W. G. T. P.—Such a design as that to which you refer must be registered under the Copyright in Designs Act. The Registrar's office is, we believe, No. 1, Whitehall; the cost is comparatively trifling, not exceeding one or two pounds, we believe. It will save you trouble to employ a patent agent to take the necessary steps.

In a Fix.—The persistent oily-looking streaks arising from the solution being repelled by the film are most probably due to the character of the collodion. Sometimes it arises from the film being too horny, at other times from the solvents being too highly rectified, in which case the addition of a drop of water to each ounce of the collodion will be found a remedy. 2. Your second difficulty we cannot understand. If your lens once defined well, it would continue to do so, unless you had been tampering with it. Have you had the lenses unscrewed, and replaced them out of proper order?

Virginian.—Much depends on the class of work you wish to do. We use for cabinet pictures (7½ × 5) a No. 1 Triple. 2. The evenness of the film will depend first on the flowing properties of the collodion, and next on skilful manipulation. If the collodion be thick and gelatinous, it is difficult to get a perfect and even film. It is a good plan not to work the collodion too low in the pourer when coating large plates.

Subscriber from No. 1.—All the conditions which are successful for portraiture will be found successful for sculpture. The exposure will be a little shorter, but take care not to under-expose, as you will risk losing texture and roundness. The method of intensifying you have found best in other work will answer here; do not aim at excessive intensity, which will also often destroy texture and modelling. Employ a diffused light for illumination.

Vitreous-ware Baths.—A Correspondent desires to inform "J. H.," who enquired after Messrs. Edwards and Son's vessels of this ware in our last, that they can be obtained of Claudet and Houghton, Holborn.

E. H. E.—The simplest method of producing prints on opal glass is by means of collodio-chloride of silver as described in Nos. 347 and 349 of the Photographic News.

A Burton.—Immersion in a bath of acetate of soda before toning has been found useful when a tendency to mealiness was present; but it is not necessary otherwise. 2. In using a phosphate of soda toning bath, first wash away the free nitrate, and then immerse in the bath which, if the weather be cold, is best used warm. 3. One grain of chloride of gold should tone from one to two sheets of paper at least. 4. There are several good manuals besides that of Mr. Hughes, which you have got, we presume; "Practical Photography," Negretti and Zambra; Mr. Heisch's "Manual;" Dr. Towler's "Silver Sunbeam;" "Waldack's Manual;" and others, are all good.

Prince John.—The mottled, dirty effect of your prints is due to imperfect fixation. The hypo was too old or too weak, or the prints were not immersed long enough or had stuck together. Vignetted prints containing more unreduced silver to be dissolved out would show imperfect fixation first. 2. It is probable that the youth would have been good with a little deeper printing and perfect fixation. Salted paper requires printing and toning in a manner very similar to albumenized paper, except that it is more apt to overtone and become blue or slaty.

J. C. states that he has met with a similar experience to that of Mr. Sutton in reference to the tendency of a sample of collodio-chloride of silver to precipitate. As we have not met with it in any instance in our own practice, in which we have made some dozens of distinct samples of collodio-chloride, we are not in a position to speak with authority as to the cause. We reprint in another page, however, Mr. Swan's views on the subject, as stated in a communication replying to Mr. Sutton. Those familiar with the behaviour of precipitates under different circumstances will readily appreciate the probability of the reasons for precipitation in this instance. We shall be glad to hear any further details of similar cases, and, if possible, with a statement of the precise conditions.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Registrations.—All Photographs sent to this Office for Registration are immediately attended to, and parties interested may venture to act upon this assurance. Our Publisher will endeavour to acknowledge the same in the News every week, and so avoid the correspondence occasioned by delay. This must be a sufficient answer to several letters now on hand.

Mr. Adam Smith, Cupar Fife,
Photograph of Rev. W. Landels.
Medcalfe and Evans, St. Julian Street, Tenby,
Photograph of J. Pope Hennessy, Esq., M.P.
Mr. Joseph Bill Robinson, Macclesfield,
Photograph of the Nomination of Members of Parliament for the Borough of Macclesfield.
Mr. William Foster, Wigton, Cumberland,
Photograph of Tom Johnston, Huntsman to the Cumberland Fox Hounds, with favourite Mare and Hounds.
Mr. Thomas Bennett, Foregate Street, Worcester,
Three Photographs of Rev. Dr. Gully.
Mr. R. W. Bustin, Hereford,
Photograph of West of England Agricultural Society's Meeting.
Mr. Hugh McFarlane, Buchanan Street, Glasgow,
Six Photographs of Views in Glasgow.
Messrs. W. and D. Downey, 9, Eldon Street, Newcastle,
Two Photographs of Earl Russell.
One Photograph of Lord Cranworth.
One Photograph of Lord Stradbrook.
Mr. William Steele, Castle Street, Dublin,
Photograph of H. B. Sheridan, Esq., M.P.

THE PHOTOGRAPHIC NEWS.

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TINTING TRANSFERRED COLLODION PRINTS.

We have recently been experimenting with a method of tinting collodion prints which have been produced on glass and transferred to paper, whether produced by the collodio-chloride process, by a modification of Mr. Burgess's Eburneum process, or any of those processes recently indicated by Mr. Tunny, of Edinburgh. By the process we are about to describe, with a very moderate amount of skill and taste, exceedingly charming and delicate-coloured miniatures may be produced, resembling in many respects an enamel painting, and with a surface perfectly waterproof and free from easy risk of injury.

Whilst the process we are about to describe is in its main features original, we may indicate the process which suggested the idea to our mind. Some years ago, a pretty coloured collodion picture was handed to us for inspection by Mr. Sutton, at King's College, if we remember rightly, with the brief information that it was American, and was styled an "Ectograph." We had seen the name referred to in American Journals, but we had seen no description of the process, nor have we since. The method has either not been published, or it has escaped our notice. The specimen to which we have referred was the only one we ever saw, except some experimental examples we afterwards attempted to produce. From the examination we had an opportunity of making, we found that the picture consisted primarily of a collodion transparency on glass, taken with the view, however, of being examined by reflected rather than transmitted light. The film was covered with a thin, translucent coating of white wax, upon which a little rough tinting was effected; the whole was then covered with a piece of buff or cream-tinted paper, which, with the rough colouring already effected, gave, through the now semi-transparent lights of the picture, a general effect of flesh-tint, the blacks being, of course, furnished by the photograph itself. This done, the picture was fitted in its case with the glass side uppermost, the picture being on the opposite side, the crude and roughly-applied colouring being seen through the collodion image and through the film of white wax, which softened and harmonized the whole. To secure the best effect it will be seen that the picture should be taken on a piece of pure white glass. The effect was altogether very pretty, and apparently produced without the expenditure of very much time or great technical skill. Such was the Ectograph.

In our attempts to reproduce the effect we were tolerably successful. The greatest difficulty was to produce a transparent positive which should be, by reflected light, brilliant, clear, and soft, of a rich, warm, black tone. The detail often seemed buried. This appears to have been a common difficulty in the attempts to produce good prints on opal glass by the ordinary wet collodion process. From recent allusions by Mr. Seely, Editor of the *American Journal of Photography*, an excellent authority, the same difficulty appears to have been felt in the States. He recently mentions this difficulty in referring to the Ectograph. With this exception, we found that, without instructions, we produced the effect very satisfactorily. The introduction and rapid spread of the card mania put all interest in such processes aside at the time, and we neither proceeded further nor published our experiments at the time. The employment of the collodio-chloride process obviates all difficulty on this score, and considerable progress has recently been made in securing the right results even with ordinary wet collodion. The method employed by Mr. Burgess with his process, and applied by Mr. Swan, Mr. Frew, and others, to ours, furnishes a suitable groundwork for a further application of the Ectograph principle, and this we are about to describe.

A delicate and not over-deeply printed impression is first produced on a piece of plate glass, properly prepared with wax, to facilitate perfect transfer. The print must be kept of a warm tone. If it be a portrait of a fair person, it may with advantage be kept of a brown tone. It is washed perfectly, and suffered to dry; it is next coated with gelatine, containing white pigment. The formula for preparing this may vary a little, and it is probable that some advantage in variety of effect may be found in using a thicker or thinner solution; but this will require verifying by practice. We have used some containing one ounce of gelatine in six ounces of water, with sufficient moist Chinese white to make the whole white and opaque-looking; and we have used some prepared by Mr. Swan. It may, with advantage for some purposes, have an extremely delicate tint of rose madder added. We have a sample of the gelatine so prepared by Mr. Cooper, ready for use, but as yet we have not tried it fully. The film is coated with prepared gelatine, and put away, lying quite level until it is dry. It is then ready for colouring.

The mode of colouring depends on the taste and skill of the artist. Either powder-colours, which everyone may use, or water-colours, may be employed. We will suppose the latter are to be used. Judgment and taste are, of course, necessary, but a comparatively small amount of manipulative skill is needed, inasmuch as a roughly-coloured picture will give a delicate effect if the right colours be employed. It must be remembered that however roughly the colours may be applied, they will be softened down and blended considerably by the film of white translucent gelatine, and the film of collodion containing the image, through which they are seen in the finished picture. And, moreover, the tints of crude colours will be equally softened and blended. As, however, the white in the gelatine will cool the colours just in proportion to the thickness of the gelatine film and the amount of white pigment present, the colours must be kept warm. As the film of gelatine is somewhat apt to work up on the application of water-colours, it is better, before commencing to colour, to coat the gelatine surface with a film of plain collodion. When this is set the colouring in water may be easily applied, and the effect and depth of colour ascertained from time to time by turning the glass over and observing the effect seen through it. The great point is to keep the print warm enough, and not overload it with colour, as it must always be remembered that when the print is removed from the glass by its transfer to paper it will appear much more vivid than it does whilst attached to the glass.

When the colouring is completed it may be either again coated with plain collodion or with varnish. This is desirable to prevent injury to the colour in the process of transferring. This may be effected in two or three ways. We have generally, after varnishing or collodionizing the coloured image, again coated it with the gelatine, and, when this has become quite dry, applied a piece of wet paper, taking care to press out air bubbles. When the whole is quite dry it is easily removed by cutting through the paper, film, &c., near the edge of the plate, and lifting the whole up with the point of a penknife; or a piece of moistened gelatinized paper may be used as described in a recent number by Mr. Frew; or the mode described by Mr. Tunny in our last volume in enamelling prints may be employed. In any case, when the print is removed from the glass a highly coloured miniature is seen, with a very enamel-like surface, of a character especially suitable for lockets, bracelets, &c.

If powder-colours be employed, less skill but a little more labour to get brilliant results will be necessary. The colours are applied direct to the dry film of gelatine without the interposition of another collodion film. By slightly breathing on the gelatine it acquires a surface which readily bites the dry colours. The same care to select the right tints is necessary as with water-colours; but it is almost impossible to apply them too roughly. If, on examining the picture through the glass at the other side, it appears insufficiently vivid or full of colour, the surface may be varnished with some varnish which gives an adhesive surface—we have used the alabastrine varnish supplied by Mr. Squire—and another coat of colour applied, and so on until a sufficiently brilliant colour is obtained. This done, we again coat with plain collodion, and transfer as we have described.

The whole process, either with water-colour or powder-colours—for we have worked the process out with both—is much more rapidly and easily effected than it appears in description. The chief point, which can only be mastered after a little experience, is the knowledge of the right colours to apply to produce the proper effect in the finished picture. If the coating of gelatine be thin, or contain very little white pigment, more care in the manipulation is necessary, as the colour is more easily seen through; but as it must also be more nearly of the tint required in the finished print, it is more easy to judge of the effect. The more white pigment in the gelatine, or the thicker the coating of gelatine, the warmer must be the colour, and the more roughly it may be applied, as the softening effect of a thick translucent film of gelatine harmonizes very roughly-effected manipulation. In all cases it must be borne in mind that the tints appear much more vivid after the transfer than whilst the film is attached to the glass. In some cases the effect of the colour is much improved by the employment of a cream-tinted paper, to which the film is transferred, instead of white paper.

Of course it must be distinctly understood that whilst a very charming picture is obtained by the judicious application of the process we have just described, the result cannot attain to the highest artistic excellence, inasmuch as the photographic image is at all times over the colour, and the delicate variety of grays, and delicate demi-tints of blue, and green, and brown, &c., seen in a highly finished miniature by an able artist, cannot be obtained. On the other hand, an advantage is obtained on the score of photographic accuracy, as it is impossible to lose the likeness in the process of colouring. A very pretty coloured photograph of exquisitely perfect and delicate surface may, however, be secured at a cheap rate, by such professional portraitists as cultivate this class of business; and amateurs will find in this method an elegant and simple mode of securing a pleasing effect, within the powers of the least practised in the use of colours.

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PHOTOGRAPHS AT THE DUBLIN INTERNATIONAL EXHIBITION.

The display of photographs at an International Exhibition of Art, Science, and Industry differs from those at the annual Photographic Exhibitions, in so far as it is rather intended as an illustration of the general capabilities and position of the art, rather than of the productions and progress of a year, and we look rather for representative pictures than for new specimens. Regarded in this light, the photographic department of the Exhibition at Dublin is in many respects a very satisfactory one, and is, perhaps, more extensive and complete than any other department in the Exhibition.

Occupying three handsome and exceedingly well-lighted rooms on the ground-floor, nearly adjoining the sculpture gallery, and close by the refreshment rooms, the photographic department is readily accessible, and in tempting neighbourhood. Between the rooms runs a wide corridor or passage, in which, well-arranged in some effective cases, the bulk of the photographic apparatus is displayed. The walls of the three rooms are well covered with pictures, as are also several cross screens, and a large table. The pictures are for the most part well hung, none having bad positions, the best pictures as a rule occupying the best positions, and the general arrangement is harmonious in effect. Turning to the catalogue (in which photography is classified in the fine art department), whilst we find many familiar names, and miss some we should have been glad to see, we also find many who have not been in the habit of contributing to former exhibitions. A first glance startles us with the suggestion of an exceedingly meagre exhibition, the numbers not reaching one hundred and seventy. A glance at the rooms dispels this notion, and a little examination explains the discrepancy. The numbers merely indicate the contributors, the pictures not being entered in the catalogue in detail, one entry sometimes including several scores of pictures. Here is the Manchester Photographic Society, for instance, entered for fifty-four photographs, the majority of these in single frames, and by many different photographers, but all entered under one number in the catalogue, and bearing the same number on the walls. This last is, indeed, the most imperfect part of the arrangement. The varied pictures of one contributor all bear the same number on the walls as well as in print. This would not matter much if they were all kept together, but the exigencies of hanging have distributed them about in different places, so that it is a difficult thing to find all the works of any one person without steadily examining every picture in the exhibition. For instance, under No. 11 we have the entry "Claudet, A., F.R.S., &c., portraits enlarged by solar camera and developed by gallic acid; portraits developed by Mr. H. Claudet's instantaneous formic acid process; medallion portraits; frame containing twenty-four carte-de-visite portraits." Now we find all the pictures under this No. 11 in one room, it is true, but so scattered in different parts of it as to need a careful search to find them. We presume that the limits of a general catalogue forbid the entry of probably over a thousand contributions in detail, and, as we have said, the necessities of hanging precluded the possibility of keeping together all the pictures included in the catalogue under one number; but the result is certainly very inconvenient. Less pardonable is the very imperfect condition of the catalogue. The first edition was confessedly and necessarily imperfect from the delay in sending in contributions, and the hurry attending the final arrangements for opening; but we find in the second edition, that contributions duly entered in the first catalogue are struck out in the second, apparently without reason. This is the case with some examples of collodio-chloride printing we contributed: these appear duly described and numbered in the first catalogue, but in the second edition there is no mention of them whatever. There appear to be other similar cases. Photolithographs by Mr. J. W. Osborne are catalogued as photographs by Korn and Co. Some frames of very prettily coloured pictures, tinted by Madame Mansion, by a peculiar process, are not entered in the catalogue at all. These things are the more to be regretted as, from the indefatigable energy, courtesy, and attention of Sir Joscelyn Coghill, this department is in many respects a great success, and received much care in the original arrangement; the subsequent alterations, re-cataloguing, &c., during his absence from Dublin appear to have been characterised by more blundering than was desirable.

As regards the character of the contributions, it is throughout sufficiently representative, and includes illustrations of almost every application of the art, and every process, from the Daguerreotype to photo-sculpture. On the whole, the local artists contribute well, and there is a fair representation of continental photography, English contributors sending, however, the chief of the pictures both in number and excellence. Coloured work takes greater prominence here than it has done in London exhibitions for some time past, almost all the Dublin photographers exhibiting highly finished coloured specimens. There are not, as indeed could perhaps have been expected, any novelties here in principle or process, although, as we have said, every known process is, we think, illustrated. In landscape there are fewer contributions of the charming scenery of Ireland than we should have liked to see, and fewer *genre* pictures illustrating Irish character than there should be, considering the excellence and extent of the material for the purpose.

We shall in our next enter into some detailed criticism; in the meantime we may mention that the jurors have doubtless by this time completed their duties, which were commenced a week ago. The result, of course, will not transpire at present. The English jurors appointed are, we understand, Mr. P. Le Neve Foster, Mr. Claudet, and Dr. Diamond. They will, we believe, be assisted by some of the representatives of continental photography, but the names have not been mentioned. We hope shortly to publish more details as to the extent and nature of the awards.

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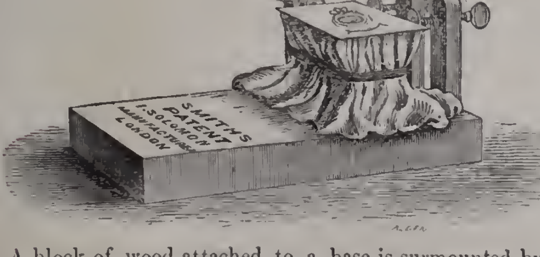
SMITH'S PATENT MOUNTER.

MR. SOLOMON has called our attention to a clever little contrivance for facilitating the operation of mounting cartes de visite. It is intended to prevent the troublesome curling of the print, to hold the print firm during the operation of pasting, and afford a simple and efficient guide in placing the print on the card. The form of the "mounter" will be seen in the annexed diagram.



A block of wood attached to a base is surmounted by a piece of zinc, the exact size of a card picture. Over this is stretched a piece of clean white calico, which is held tight by an india-rubber band round the block. This piece of calico is saturated with clean water. The print, ready trimmed for mounting, is now placed face downwards on the cloth, the wet surface of which at once makes it uncurl, whatever tendencies to roll up it may have had before, and the print is held firm in its place by the action of the moisture, whilst it is brushed with the paste, without either danger of moving about over a pasted surface, or curling up, both of which in the old method are frequent sources of the face of the print being smeared with the adhesive material. The print being duly covered with the paste or other material employed, the card is laid upon it, the sides touching the two guides, and the end, one; it is then pressed down, and on raising the corner of the card the print adhering is of course raised with it. The guides for the card are readily adjusted by screws so as to allow whatever margin may be desired. The whole arrangement is certainly very ingenious and efficient.

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A SIMPLE AND USEFUL BICHROMATE PROCESS.

BY A PRACTICAL MAN.

THE author of this paper has for some time past printed and multiplied to a great extent the following subjects:—Ornamental address cards, ornamental cards for mounting medallion photographic portraits, crests, coats of arms, monograms, facsimile signatures, invitation cards, visiting cards, Christmas cards, note head paper, new year cards, and note heads; Valentines, copies of lace, ferns, feathers, lace paper, botanical specimens, sea weeds, mosses, wild flowers, &c. &c. By these enumerations it will be perceived that the process may be used in a variety of ways, and its simplicity and cheapness at once made manifest by the following description of the *modus operandi*:—

To prepare the solution.—Take half an ounce of bichromate of potassa, put it into a saucer, and pour about 2 ounces of hot water over it, stirring until dissolved. When cold it may be applied to the cards or paper with a camel-hair brush.

The paper and cards to print on.—After trying a great variety of samples, the best results on paper were given by hard stout cartridge paper, machine surfaced drawing paper, plain photographic paper, and albumenized paper; on cards, bristol board yielded good impressions, but the most generally successful results were obtained by using "Dickinson's extra superfine cards;" these are very convenient, as they are cut to various sizes, and can be procured at any stationer's. To prepare the card or paper, brush it over evenly with the solution, and then let it dry; when dry, brush it over a second time, and when this second application is also dry, the surface is ready to print on; or the cards and paper may be dried at the fire. In this application of the bichromate there is no necessity to go into any dark room; it may all be done in moderate daylight, as far from the direct light of the window as convenient; it is also much better, and more successful results are obtained, by preparing the cards or paper about an hour before printing on them. Narrow and broad ribbon and pieces of fine closely woven silk may be prepared in the same way, and, when well washed, dried, and ironed after the exposure, have all the appearance of a white design wove on a darker ground.

The manner of preparing the designs for printing, or the subjects for copying.—If it is only intended to copy small outline subjects already produced in printers ink or copper-plate impressions of monograms, crests, book plates, signatures, &c., they must be selected, printed on very fine thin paper with no printing or writing at the back; it will also be found of service to rub the backs with a piece of fine white wax, and then iron them with a warm flat iron between folds of blotting paper, and they have somewhat the appearance of proofs on ground glass. If the design has to be made, the following method will be found to yield satisfactory results: take a piece of transparent tracing paper, any desired size, and trace the subject from the design or sketch on plain paper; this must be done with a broad-nibbed quill pen, from which the colour flows freely, a cake of the penny water colours (purple) being about the best thing that can be used, rubbed up with soft water on a palette or the back of a plate, and the pen charged with the same; after the design is traced or drawn on one side of the transparent paper, and has become thoroughly dry, go over all the lines on the back or reverse side, which will have the effect of more thoroughly stopping out the light, and consequently yielding firmer and better impressions. Another medium on which the design may be drawn, where a great number of impressions are wanted, is "transparent vellum tracing cloth." This is not so likely to injure or tear as the tracing paper, and merely requires the colour with which the pen is charged to be mixed with a little diluted ox gall—this takes off all greasiness, and makes the colour flow easily and freely. Where centres or shields on cards or pieces of paper are required of a blank white, that effect is produced by placing a piece of cardboard over the space while printing, the said piece of cardboard to be covered with a thick coating of purple or black, and on this entirely depends the purity of the white. In printing proofs on *albumenized* paper, these conditions are of very great importance, as in order to yield a good pure white impression on a satin ground, the subject must be very evenly and firmly drawn, the paper in the first instance *bichromatized at the back, not on the face*, or albumen surface. In subjects on albumenized paper very large spaces may be left, well stopped out with darkened cardboard; and in these spaces can be inserted chromo-printed subjects or coloured vignettes executed by hand, medallion photographs, portraits, &c. &c.; in fact, the variety of design and treatment is too numerous to describe.

The Printing.—Lay the transparent design on the bichromatized card or piece of paper, and place in a pressure-frame in the same manner as in printing photographic proofs. For small subjects one of the common transparent slates used by children to draw upon answers the purpose very well, by inserting a piece of thick plain glass in lieu of the ground; or if neither of these is at hand, take a medium or quarter American preserver, put in the piece of glass, then the subject to be copied, and piece of bichromatized card or paper; then another piece of glass, and double round the lap of the preserver, when it is ready to expose to the light. This exposure will vary (as in silver printing) according to the intensity of the light.

The situation and time of year.—In full sunlight in summer five minutes will be found sufficient; in diffused light, from a quarter to half an hour. On dull days the process is much slower. On removing the proof from the frame, a bright yellow impression ought to be seen on a somewhat dirty-looking russet ground. Put it into a pan of water to soak occasionally, moving it about, and in a short time the yellow will have disappeared, leaving a clear white subject on a light or dark buff ground, according to the intensity of the proof and the length of exposure.

When the bichromate is sufficiently washed out, so as to leave the whites quite clean, the proof may be taken out and dried, and when dry pressed or ironed. The impressions on albumenized paper must be allowed sufficient time to soak all the albumen away from the whites, which, when effectually done and the print mounted, the result is very good. The albumen proofs may also be immersed in a strong solution of hypo; this will yield a clear white subject on a dull silvery grey ground. The immersion must not be carried too far, but the prints watched from time to time till the required tone is obtained, then taken out and washed in plenty of clean water, and mounted on cards with gum or starch paste in the same manner as *cartes de visite.*

It will be at once seen that the method described is very simple, and may be applied to many purposes and in many ways. The sensitive property of the bichromate has long been known, but the method and manner of preparing the *matrix* or design to print from is to a great extent original. Those dealers and amateurs, &c., who have any quantity of albumenized paper that has been found *unfit* for *silver printing*, will find it quite *fit* for bichromate printing; consequently, a very large amount of property, now considered almost useless, may be turned to profitable account. The Editor has been furnished with a variety of proofs showing the results of the process; he can therefore record his opinion as to the merits or demerits of the same.

[Several pretty designs very effectively printed in this way have been forwarded by our contributor, who also informs us that he will forward specimens to those interested in this process at a nominal cost. Applications, with a stamped and directed envelope containing twelve stamps sent to us, will be forwarded to him.—Ed.]

GLUES AND OTHER ADHESIVE MATTERS.

BY A PRACTICAL MAN.

Glues are, for the most part, made from the skins of animals. The older the animal the better the glue. That made from whole skins is the best, while the glue made from the shavings, parings, or scraps is the worst. In the preparation and making, the materials are soaked in cold water for two or three days, well washed, and then boiled till a small portion of the liquor, withdrawn for testing, solidifies into a consistent jelly after a few minutes' exposure to the cold air. The liquor is then passed, while hot, through osier baskets, or other contrivances, to separate the undissolved impurities. It is then allowed to stand for some hours in a vessel surrounded with warm water, to allow of the grosser impurities to subside, and finally the clearer portion of the liquid is drawn off and poured into flat frames or moulds. After from twelve to eighteen hours, it has sufficiently solidified to enable it to be cut into square pieces or cakes, and afterwards it is further dried in the wind in a sort of coarse net. As a finish to their drying, the cakes are dipped in water and hung on a string, or, if the weather be not hot enough, transferred to the stove-room.

A glue that will hold good for coarse and rough purposes, and generally proof against water, is made by mixing about a handful of quick-lime with four ounces of linseed oil, and boiling them to a good thickness. Then spread the mixture on a tin plate and allow it to cool. After a short time it will become exceedingly hard, but may be easily dissolved over a fire by gentle heat when wanted.

A strong and very fine glue, fit for delicate work, may be prepared with isinglass and spirits of wine. Soak one ounce of isinglass for twenty-four hours in three ounces of methylated alcohol. Let them be gently boiled together and kept stirred till well mixed, and till a portion withdrawn and allowed to cool turns to a strong jelly. Then strain the solution, while hot, through a clean linen cloth into a wide-mouthed bottle, to be kept well corked or stoppered. A gentle heat suffices to dissolve this glue into a transparent and almost colourless fluid, but very strong, so that any article fastened together with it will separate elsewhere rather than at the parts joined. It may be used as a cement for joining paper, much superior to paste; also for fastening paper on to wood, &c., &c.

Vellum or parchment glue may be made by steeping half a pound of the cuttings or shreds of either of the above articles in cold water for several hours, then boiling the same in three quarts of water till reduced to one quart. It is then to be strained from the dregs, and boiled as detailed in the first instance.

A strong compound glue may be made by infusing a mixture of dry common glue with isinglass in small pieces, in as much spirit of wine as will cover them, allowing them to soak for twenty-four hours. Then melt the whole together by the aid of heat, and add as much fine-powdered chalk as will make the mixture an opaque white.

A strong glue that will resist moisture may be obtained by melting two ounces each of gum sandarac and of gum mastic in a pint of spirit of wine, to which may be added about an ounce of clear turpentine. When dissolved, take equal parts of isinglass and parchment glue, cut them into small pieces, and pour the solution of gums upon them, and melt the mixture in a covered vessel at a slow fire; then strain through a coarse linen cloth. Pour back into the vessel and place it again over the fire; add about an ounce of fine glass, powdered and sifted, and mix well.

Another strong glue that will resist water may be made by adding half a pound of common isinglass glue to three pints of skimmed milk, and evaporating the mixture *to a due consistence.*

Liquid glues.—In a glazed vessel melt over the fire a quarter of a pound of glue in about a pint of water, stir it well, be sure that it does not burn, and, when all melted, drop in gradually some nitric acid, when effervescence will take place. Allow it to cool, and then cork it up in a wide-mouthed bottle. This glue is always ready for use, requires no melting, and is often advertised as the "celebrated *liquid glue.*" This article, although cheap and handy, does not keep well; therefore but small quantities should be prepared at a time. For long keeping, glue diluted with absolute alcohol is much better and not more costly. Common shellac, dissolved in naphtha to any required or desired consistency, is a good and cheap fastener for coarse and ordinary work.

NEW LIME TONING BATH.*

It is with great reluctance that I undertake something so foreign to my habits as to write a paper for publication; but if, as Lord Bacon says, every man owes something to the business or profession that supports him, so, I suppose, it may be said, something is due to the art which amuses him.

About two years ago, when the formulæ for lime toning were first published, I tried them all as they appeared, but wholly without success. The prints either bleached or mealed, and were invariably spoiled. As the evidence of the fact of successful results being really obtained in Europe became stronger and stronger, I was induced to give the subject more serious reflection; and, from remarking that time was invariably insisted upon as an element of the problem, and also that hot water was more successfully used than cold, I became convinced that some obscure chemical action took place between the component parts of the lime toning bath, and that it was not a mere mixture or empirical nostrum. If this view were correct, it would follow that were the constituents of the bath to be brought into contact in a more concentrated form than was given in any of the recipes, and their mutual reaction facilitated by grinding them well together, the bath could be successfully made. Acting on this idea, I placed in an ounce measure four drachms of a solution of chloride of gold of the strength of one grain to the drachm, and into this, scraped from a "chalk ball," about a tea-spoonful of chalk, and ground it well together with a stout glass rod for about ten minutes. To this I added a half-ounce of distilled water, and, after well stirring, introduced 4 grains of chloride of lime, and ground it again in the same manner for ten minutes longer. After standing a few hours, I poured the whole, sediment and all, into a bottle containing 20 ounces of cold distilled water, and shaking well together, let it stand over night to settle. The next day I poured off a portion of the clear part, and used it for toning, to my entire satisfaction.

This bath remained in use about a year. At the end of that time it had become slightly viscid, probably from dissolving some of the albumen of the prints, and slightly yellowish in colour. It did not cease, however, to tone as well as at first. The gold was then thrown down by sulphate of iron, and a new bath made, following precisely the formula as given above, and this bath is now in good working order, although used, very irregularly, for the past eight or nine months.

The mode of keeping the bath in order was as follows:—As soon as the toning for the day was finished, the bath was poured back from the pan to the bottle, and into this was put a small amount of the chloride of gold solution of the strength of one grain to the drachm. The amount found necessary to keep up the strength of the bath was one drachm of the solution (being one grain of chloride of gold) for every two whole sheets (17½ by 22 inches) of paper toned. At the same time was added about one grain of chloride of lime for every grain of gold so added; but as this article is extremely variable in strength, the only rule followed was, that the bath should smell faintly but distinctly of chlorine. The bottle containing the bath was well shaken when these additions were made, and then set aside to settle for the next day's use.

I have never observed either mealiness or unusual bleaching in using this bath; by unusual bleaching I mean any greater reduction of tone than takes place with the gold bath prepared with bicarbonate of soda, or with borax or phosphate. The toning may be continued to a vigorous black in all cases when desired, without fear of inkiness or bluing; or it may be stopped short of this, and as great a variety of warm and tender grays be secured in landscapes as can be attained with any other toning bath that I have tried. The gold never falls down as a black powder, if care be taken that the bath always smell of chlorine. The time required is about fifteen minutes for the strength given above, but it may be reduced or prolonged as the bath is made stronger or weaker at the pleasure of the operator.

I have never been able to discover any advantage in adding acetate of soda to this bath, as recommended by several photographers of high reputation; nor have I observed that the purity of the chloride of gold was of any great importance. The bath first made was made of pure chloride of gold, and the next with the double chloride of gold and calcium; both worked equally well; and I have known it to be made with the chloride of gold and sodium of the shops with the same success.

Wishing to ascertain if any definite chemical compound was formed in this bath, I placed 4 ounces of it in a capsule, and set it away to evaporate in a warm closet carefully covered from dust. At the end of three days it had evaporated to about a tea-spoonful, and was covered by a film of such extreme tenuity as to display vividly the iridescent colours, but of such toughness that no shaking or knocking of the capsule would rupture it. At the end of three days more, no further evaporation having taken place, this film, formed probably by the albumen dissolved off the prints, was torn across, and in the course of the day the evaporation was complete. Under the microscope a powdery white mass only could be distinguished, which became rapidly deliquescent in the air. A teaspoonful of distilled water was added, and, after being in contact for half-an-hour, was filtered off, and the filtrate placed under the air pump, and over oil of vitriol, and in twenty-four hours had evaporated to dryness. This, under the microscope, presented the appearance of a mass of fan-shaped crystals, not quite transparent, and, imbedded in this mass, were numerous octahedral crystals with an amethystine tip. There were also a few ruby red crystals of the characteristic colour of pure terchloride of gold. These latter were carefully separated under the microscope from a portion of the mass, and the white fan-shaped, together with the octahedral crystals imbedded therein, dissolved in a few drops of water. This examined by the spectroscope gave the lime lines very strongly marked, but not the gold lines, probably owing to the fact that heat employed (a Bunsen burner) was not strong enough to volatilize any portion of the gold, but that the gold was there was afterwards satisfactorily ascertained by its characteristic reactions, both with sulphate of iron and chloride of tin.

It is, therefore, probable that the octahedral crystals with the amethystine tips are some definite compound of lime, chlorine, and gold; but to determine this with precision would require the knowledge and ability of a great chemist like your correspondent, M. Carey Lea, but is beyond the power of your obedient servant, S.

Providence, May 27, 1865.

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PARAFFIN PAPER NEGATIVES.

The *American Journal of Photography* presents, with a recent number, a print from a paper negative by Mr. H. J. Newton. The editor thinks that the claim made for paper negatives of rendering lights and shadows with more pleasing harmony is well made out by the picture in question. The subject, containing in the extreme distance the fine detail of buildings rendered on a minute scale, is a very trying one for a paper negative, and would, perhaps, have been produced with more delicacy and crispness by a collodion-negative. There is, however, about a good paper negative generally a pleasant suggestion of atmosphere and texture, especially suited to some subjects. The following are the details of Mr. Newton's process as given in the Journal in question:—

Take thin Saxe negative paper and saturate it with paraffin, by placing sheets upon a plate of glass and holding it to the fire until it becomes warm enough to melt the paraffin, which is then rubbed upon the surface. When thoroughly saturated, place another sheet upon the first, and proceed the same as before. You can in this way prepare as many as you please. Separate them while warm. The sheets should then be ironed between blotting paper, or, what perhaps is better, printing paper with blotting paper over it. All the excess of paraffin should be ironed out. It is next immersed for two hours in a solution containing 10 grains of iodide, and 10 grains of bromide of potassium to the ounce of water, then hung up to dry. When you wish to use it, sensitize by immersing with a glass rod or triangle, in a 20 gr. silver bath, to every four ounces of which add one ounce of acetic acid, for about ten minutes, then wash thoroughly and dry between blotting paper. If the sheets are rubbed perfectly dry they will remain smooth in the holder. This result can be attained by placing them, when dry, between sheets of clean printing paper, and letting them remain an hour or less under pressure. It is then placed in the holder, and exposed three or four minutes. The time will be about two-thirds the time for dry tannin plates, developed in a solution of gallic acid, 6 grs. to the ounce, to every 4 ounces of which 1 oz. of acetic acid is added, and 1½ to 2 grains of nitrate of silver to the ounce. Dissolve the silver in a small quantity of water, and add immediately before using. Several pieces can be immersed and developed at the same time. Develop to little more than the desired intensity. It is then washed clean, which can be done most effectually by placing it upon a sheet of glass and using a soft linen cloth or sponge, after which put it in a fresh *hypo* bath, of the ordinary strength, and let it remain from 10 to 30 minutes, or until it is perfectly cleared up and the intensity satisfactory. It is then washed as before, and dried between blotting paper. If the negatives are of large size they should be pressed perfectly dry, to prevent any wrinkles in the paper, when ready for use. When they are perfectly dry the picture becomes obscure, but is again brought out by warming sufficiently to melt the paraffin. The negative is now complete and ready for the printing frame.

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* From the *Philadelphia Photographer*.

My holders are made with a curved back, which is fastened in with buttons; the curve corresponds to the field of the lens. The holders are very simple, having no opening except the slide. The paper is fastened upon the soft wood with small tacks, pressed in with the thumb. I have a number of these, which are light, and can be carried without any trouble.

The ordinary gallic acid solution will not keep, and it is no little trouble to dissolve the acid every time you make a picture. I have therefore made a developing solution which keeps indefinitely. In 10 oz. of alcohol dissolve 2¼ oz. gallic acid; the alcohol will require to be heated to nearly boiling. If the acid is *perfectly pure* it will dissolve entirely, if not the sediments will settle in a short time. Make another stock bottle in the following manner:—To 1 oz. of the alchoholic solution add 3 ozs. acetic acid,—this will also keep. To develop, take 5 drachms of stock bottle No. 2,—add 11 drachms water, and 1½ or 2 grs. to the oz. nitrate silver, dissolved and added the same as in previous directions.

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TO PREVENT SENSITIZED PAPER FROM TURNING BROWN IN THE DARK.

BY C. A. SEELY, M.A.*

LAST summer, in company with many others, I was much annoyed by sensitized and especially fumed paper turning brown before it could be printed. I made an investigation of the subject, and arrived at what seems, after many trials, to be a complete and sure prevention of the evil.

The preventive is hydrochloric acid applied to the paper before silvering. I have tried several methods of applying the acid, and find that the following are most useful.

1st.—Sprinkle blotting paper with dilute hydrochloric acid, make a pile of the sheets, and let it remain 12 hours or more, till the paper becomes uniformly impregnated. The photographic paper is now to be placed between sheets of the acidulated paper. A pile of the two papers may be made, alternating the sheets.

2nd.—The photographic paper is exposed to the fumes of the acid in a fuming-box constructed and operated like the ordinary fuming-box. The acid, which in this case should be strong, is placed in a wide-mouthed bottle, or a saucer, or may be sprinkled on the bottom of the box. The time of fuming, depending upon the strength of the acid, &c., is easily learned by practice. This plan is preferable to the first.

Paper properly treated by this process will keep white for a long time in the warmest weather.

◆

AN EXCELLENT METHOD OF CLEANING VARNISHED PLATES.

BY JEX BARDWELL.*

TAKE one pound of old collodion, and add to it one ounce of muriatic acid, and shake well.

Then take a varnished plate and flow with the above, on the varnished side, the same way as you coat a plate with collodion; after which, lay it on the table, coated side up. Coat another plate in the same way, and lay this one on the other, face to face, so that the two varnished sides are together, and proceed in this manner until you have coated as many plates as you may wish to clean, and so let them remain for at least fifteen minutes: then separate two plates and place them in some water, and at the same time rub them either with your hand or a cloth, when the varnish and collodion will all come off as easily as a collodion film which had never been dried. Wash well, and clean as a new plate. I know of no better method than that of Mr. Carey Lea, which is that of placing the plates into a solution composed as follows:—

Sulphuric acid	1 ounce.
Bichromate of potass	1 "
Water	1 pint.

Mr. Lea remarks: "Glasses left in this solution over night (except in obstinate cases which may require a little longer treatment) will generally be found to require only rinsing off, or at most a gentle rubbing, to be perfectly clean. Grease spots, obstinate stains, remains of old collodion, and all the other troubles, loose their hold, and the task of cleaning loses almost all its trouble."

To those who may have a large stock of old and defaced negatives it will be of the utmost value. I would say to all those who read the Journal—try it.

◆

A DRY COLLODION PROCESS.

BY M. PAUL GAILLARD.

IN trying the various known dry collodion processes, I have ascertained that we can obtain with all of them, more or less easily, and with more or less certainty, proofs that may be considered as satisfactory.

I have sought the means of rendering success more regular, and the preparation as simple as possible, and I have arrived at a process which has given me very good results during the past six months.

Without a coating of gelatine the film seldom becomes detached. In some cases it will only be necessary to varnish the edges of the negative; but I never taken even this precaution.

The plates will keep good at least six months, which is as far back as the date of my commencing my experiments; and the sensitiveness is sufficiently great to admit of a portrait being taken in thirty seconds in the shade.

I recommend those who undertake this process to faithfully adopt the preparations of the formulæ given. I believe that success depends upon their rigorous exactness.

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* From the *American Journal of Photography.*

* From *Humphrey's Journal.*

The cleaning of the glass plate must be as carefully performed as possible: collodion will not adhere to a dirty glass plate. Whatever mode of cleaning be adopted, I recommend concluding with a mixture of rotten stone and water acidulated with a few drops of nitric acid.

Collodion :—The exact proportion of the iodides appears to me of great importance. The formula of the collodion that has given me the best results is the following :—

Ether	70 parts
Alcohol at 40°	20 „
Sensitizing solution	10 „
Gun-cotton	1 „

Sensitizing Solution :—

Alcohol	100 parts
Iodide of ammonium	2 „
Iodide of cadmium	6 „
Bromide of cadmium	6 „

Add a few grains of iodide to the collodion to give it a "sherry colour."

Sensitizing bath :—

Distilled water	100 parts
Crystallized nitrate of silver ...	10 „
Acetic acid	10 „

The plate, after remaining about five minutes in this bath, is immersed in a dish of distilled water, and afterwards in three dishes of rain water successively; after which it is washed under a stream of water, immersed in the preservative solution, and inclined against a wall to dry spontaneously. Each washing and the immersion in the preservative solution must continue at least five minutes.

If the preparation has been well done, the dried plate will have the brilliant aspect of an albumenized plate.

Preservative solution.—Prepare separately the two following solutions :—

No. 1.	Water	300 parts
	Tannin	20 „
No. 2.	Water	700 „
	Dextrine	50 „

And pour, little by little, solution No. 1 into solution No. 2, stirring meanwhile, adding 50 cc. of alcohol, and filtering.

This solution will keep several months.

The development can be performed in the hand, and does not require much longer time than a wet plate. It is sufficient to pour on the plate, previously moistened with water, the following solution :—

Distilled water	500 parts
Pyrogallic acid	2½ „
Acetic acid	5 „
Alcohol	75 „

Adding to every 100 cc. two drops of the following :—

Distilled water	100 parts
Nitrate of silver	3 „
Acetic acid	8 „

The picture is strengthened by adding more aceto-nitrate immediately the details of the shadows make their appearance.

While the exposure required to obtain portraits on plates which had been prepared six months was thirty seconds in the shade, landscapes taken with a single objective required from a minute and a quarter to a minute and a half.

◆

THE PANORAMIC STEREOGRAPH.

BY PROFESSOR TOWLER*.

Whilst confined to the bed of sickness, with little else practically to relieve the redundancy of thought that builds and rebuilds creation upon creation until the body sinks a victim to the excited nervous operation—with little else (we repeat) to relieve all this than a few baskets full of stereographs—we came to the conclusion, after repeated examination of our favourite haunts on the Nile, the Rhine, the Danube, the Arno, the Hudson, the Mississippi; on Alpine mountains, on the Catskill, on Kearsarge, in the Devil glens of Baden and Switzerland, in scenes among the Turks and Chinese, in the late desperate struggles between the North and the South—there was always *one thing wanting* in each stereograph: this, that is the stereograph, presented the spectator upon the scene, but allowed him only two pinholes to look through; his vision became thus circumscribed; he could see two or three things immediately before him, but nothing to the right, nothing to the left.

Here's a view of New York. Examine it for yourselves. What do you find? and what is wanting?

There's Broadway complete from Stewart's at the corner of Chamber's Street, and looking towards Grace Church, you can recognize almost each store, each building, until finally the view ends in mist and smoke.

Where's the City Hall? The Tombs? The thousand etc.'s?

Excluded on the right and on the left. The stereograph is not a panograph, and can only become an approximation to it as we increase the number of views consecutively from each stand-point. The universal want, therefore, to each stereograph of any locality is a series of panoramic stereographs from the same point, numbered in order, and each beginning where the other ends.

There is no difficulty in gratifying the desire in this respect, you observe. Certainly not, and much less than you imagine in your observation; for we can take *three or four* panoramic stereographs in the same time as we can take one.

For instance, fix up your camera with a pair of lenses whose principal focal length is ten inches or thereabouts, such as a pair of Voigtlander's Orthoscopic Tubes; let these tubes be nine inches apart. The plate-holder is arranged so as either to contain a single lens of glass, 18 inches by 4, or preferably, two pieces, each 9 inches by 4.

The operation of focussing, coating with collodion, and of the rest remains the same.

As soon as the plates are developed, fixed, and washed, it is necessary for those persons who have not yet mastered our instructions on the Strabonic Stereograph, and who cannot tell which of the two plates is the right picture, and which the left, to *mark* each plate with its appropriate R or L, and the general panoramic number corresponding to either. The plates are then varnished, and, when dry, prints are taken from them. Thus far the operation has entailed no extra labour, or very little more, if two plates have been used instead of one.

The prints are washed and dried, and then each one is cut on the glass plate of an even height and length, and so as to comprehend the same amount of material. Thus, we will suppose that, by cutting off a slip of paper above and below, the height is reduced to three inches; and, by cutting off from either end, the length has been reduced to 8¾ inches.

Let the following diagram represent the left and the picture endwise in contact, and each one divided up as we propose in our next step.

Left Panoramic Picture. *Right Panoramic Picture.*

A	B	C	A′	B′	C′

Thus the rectangles A and A′, B and B′, C and C′ contain each the same amount of picture and on corresponding positions; we propose, therefore, to cut the three panoramic prints each into three equal portions, to mount A and A′ on one mount, B and B′, on another, and C and C′ on the third mount, and finally to number the mounts 1, 2, 3 of the Panoramic Picture No. 2.

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* From *Humphrey's Journal.*

By means of this step we obtain three stereographs of a given locality and from the same standpoint at the same time. By turning the camera on its tripod other three can be taken either on the right or on the left, or on both sides.

During our Evening Amusements at Home we become enabled to examine panoramically the whole city of London taken from the turret of St. Paul's, or of Paris taken from one of the towers of Notre Dame; and with the same facility as you could by turning round on either of the two points mentioned.

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ASTRONOMICAL PHOTOGRAPHY.*

At a recent meeting of the American Photographical Society Mr. L. M. Rutherford, presented a photographic picture of the moon, nearly two feet in diameter, made from a negative obtained by means of his large refractor. As this picture equals in sharpness one of about the same size made by Dr. Henry Draper with his silver reflector, the Society were anxious to learn how the obstacles, which had previously been found in the use of the refractor for making well-defined pictures, had been overcome. Mr. Rutherford stated that, by means of the spectroscope, he had been enabled to examine the achromatic condition of the objective. The image of a star at the focus of a perfectly corrected objective would be a point, the apex of all conceivable cones having the object glass, or parts of it, as bases. This point falling upon a prism would be converted in a line, red at one end and violet at the other, with the intermediate colours in their proper places.

If, however, the different coloured rays are not all brought to the same focus, the spectrum will no longer be a line, but in the uncorrected colours will be expanded into a brush, the width of which will be the diameter of the cone where intercepted by the prism. It will thus be seen that a simple glance at a star-spectrum will indicate at once what parts of the spectrum are bounded by parallel lines and consequently converged to one focal point, and what parts do not conform to this condition, and also the amount of divergence. On applying this test he found that an objective of flint and crown glass, in which the visual was united with the photographic focus, is a mere compromise for convenience in which both the visual and actinic qualities are sacrificed.

In order to bring the actinic portion of the spectrum between parallel borders (*i.e.*, to one focus), he found it necessary to combine a given crown lens with a flint which will produce a combined focal length about one-tenth shorter than would be required to satisfy the conditions of achromatism for the eye; but a photographic lens, in this condition giving a perfect picture, is entirely worthless for vision.

Having obtained the achromatic correction, he commenced the delicate task of producing the correction for figure, in which the judgment of the eye is useless unless entirely protected from the influence of all but the actinic rays. A cell of glass enclosing a sufficient thickness of cupro-sulphate of ammonia, held between the eye and the eye-piece, enabled him to work for coarse corrections upon *alpha* Lyræ and Sirius, but so darkened the expanded disc of a star in and out of focus, that all the final corrections were made upon tests by photography, which gave permanent record of all irregularities of surface to be combated. Still the process was long and tedious, dependent upon three stars as tests, and they too often obscured by bad weather. This objective he completed about the first of December last; it has the same aperture as the achromatic, 11¼ inches, with a few inches shorter focal length, and can be substituted for it in the tube with great ease. With this corrected objective he can picture any object as seen, provided there is sufficient light and no atmospheric obtacles. He had obtained images of stars of the eighth and ninth magnitude. An exposure of one second gives a strong impression of Castor, and the smaller star is quite visible with half a second; this is only about one-tenth of the time required with achromatic objective. Since the completion of the instrument up to 6th of March, but one night had occurred in which the atmospheric disturbance did not prevent a good impression on that night; three days after the first quarter the exposure was from two to three seconds, and negatives of superior sharpness were produced. For the full moon the exposure is about a quarter of a second.

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A SHORT LESSON ON PLATING AND GILDING.

BY PROF. TOWLER.*

The objects to be plated or gilt must be thoroughly cleaned from every impurity, such as oxide or tarnish, by means of a brush and rouge; they are then dipped in a solution of salts of tartar to remove grease, and finally in pure water.

So prepared, they are suspended on the negative hook, and immersed in the electrolyte. The plate on the positive hook is likewise immersed in the same solution and brought near to the object, but *not into contact* with it.

Things being so arranged, the electric current now circulates, because the circuit is now complete, passing along the positive wire to the plate at its end, where it comes in contact with the metallic solution between it and the object connected with the negative pole. This solution, consisting of water and a metallic salt, is decomposed by the circulating current in the following manner:—In the first place, the water is decomposed into its elements oxygen and hydrogen, which, being separated, rush in opposite directions, the hydrogen towards the object, whilst the oxygen affects the positive pole or plate; secondly, the metallic salt, infinitesimally divided by solution, is also broken up or decomposed into its elements; thus the chloride of silver is separated into silver and chlorine, the latter affecting the positive pole, whilst the silver is deposited on the negative pole. These two decompositions take place consentaneously, although we have used the expressions "in the first place" and "secondly," as if one operation were consequent on or subsequent to the other; this is not so; and, furthermore, certain elements thus liberated from two compounds frequently cross over and unite so as to form a new compound, as for instance, chlorine with hydrogen, &c.

Take out the object from time to time and examine it. If the coating is purely white (if silver), or purely yellow (if gold), the operation is going on right, and may continue until the requisite amount of deposition has been obtained. By this means the metallic film thus deposited may be made of any thickness whatever.

But the metallic film is not always pure in its kind; on the contrary, it is sometimes quite black, and sometimes granular or crystalline. These irregularities can be prevented by changing the distance between the two poles, by moving the positive pole about, by diminishing or increasing the thickness of the positive wire, by warming the electrolyte, or by increasing or diminishing the number of elements in the circuit. In fine, much experience is required before the best conditions can be obtained at once under given circumstances.

As soon as the object has received its required amount of deposit, it is taken out of the electrolyte, washed, dried, and burnished on those parts which are to appear bright and brilliant, whilst the remaining parts remain dead and frosted. Burnishing tools are sold for such purposes; but, in cases of need, a long dog's tooth may be used. Rouge (sesqui-oxide of iron) is used for polishing the object by means of a tooth-brush or wash leather.

The dilute sulphuric acid once used is thrown away; but the nitric acid is poured back into the stock-bottle for future use. The latter has, however, undergone decomposition during the operation, and has become diluted with water formed by the elements liberated during the circulation of the electric current through the sulphuric acid and nitric acid; thus the hydrogen from the water, holding the sulphuric acid, passes through the earthenware cell and combines with an equivalent of oxygen liberated from the nitric acid, whilst the peroxide of nitrogen passes off in fumes. In consequence of this gradual dilution the nitric acid becomes too much impoverished for use in the course of time, and must be replaced with concentrated acid. The dilute acid may be used for other purposes.

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* From *Humphrey's Journal.*

* From *Humphrey's Journal.* Concluded from p. 331.

Place the porous earthenware cell in a dish of water when it is emptied, as also the zincs for an hour or two, then remove them to dry until again required.

Correspondence.

OXYGEN GAS.

Sir,—Being a subscriber to your valuable paper, and observing in the issue of the 13th of January, 1865, an account of a fatal accident at Manchester, arising during the preparation of oxygen gas from chlorate of potassium and binoxide of manganese, I beg to offer the result of my experience for the benefit of my brother photographers and the public in general. On the evening of the 30th of December, 1864, whilst preparing oxygen gas, I had filled one large bag, when, running short of binoxide of manganese, I sent to a chemist and procured 2lbs. On return of the messenger, I washed out the retort and dried it as usual, then placed about $\frac{1}{4}$lb. of the mixture into it, made the connections as usual, and placed it on the fire. It had been there but a few minutes, when, finding the gas was not coming off, the fire being low at the time, I proposed blowing it, but my assistant said it would come off soon enough, as there was plenty of time. A fearful explosion then ensued, the report of which was so violent as to be heard at a distance of three miles. I was knocked down insensible from the effects of the combustion, and, upon recovering myself, was informed that the retort had exploded; and having been taken to a friend's house and attended with all care, was recommended to call in a doctor, which I did, and he gave me very little hope of recovering my sight. I laid for seven or eight weeks before I was able to get about, after having undergone the operation of cutting a piece of the retort from the pupil of my eye, which caused such intense pain that I could not endure a similar operation upon my other eye, in which there is at the present moment another small piece of copper, nearly causing blindness. My assistants were disposed of in a more gentle manner than myself, one escaping without injury; but the other had congestion of the lungs from the effects of inhaling the gas, about 4lbs. of the mixture having been set on fire by the sparks from the explosion of the retort, the mixture being on the table. I herewith beg to enclose a photograph of the retort in its sound condition, and the state it was found in after the explosion; also a sample of the binoxide of manganese as supplied to me.

Hoping this may prove of service to some of your many readers,—I am, sir, yours truly,

Geo. J. Freeman, Photographer.

97, *Flindley Street, Adelaide, South Australia.*

P.S. The mixture I used was 2lbs. of chlorate of potassium and 1lb. of binoxide of manganese.

PANTASCOPIC CAMERA.

Sir,—In accordance with the concluding sentence of my last, I now proceed to answer at length Mr. Johnson's communications which appeared in your publication of the 7th instant.

He commences by an unnecessary notice of the eccentricity of my signature. This of course I should never have thought of mentioning, had not that eccentricity been so exceedingly painful to him as to require, for the sake of relief, that he should make superfluous mention of it in the pages of a contemporary in which it never appeared.

That signature, eccentric as it is, had a most reasonable origin, and being the one which I had borne in a foreign country, and by which my letters would at once be recognised there by my friends, I had chosen to adopt it. However, as it appears to act upon the constitution of Mr. Johnson much as an emetic would do, for the convenience of that gentleman, and in order that the public may not be disgusted with what, under its continued influence, he might be caused to eject, I hereby beg to reduce that signature to the first three letters X. Z. C.

The second paragraph of Mr. Johnson's letter (the one of doubtful sense), I suppose was intended as an intimation that his patent rights included the privilege of using talc plates for photography.

It has been and still is very much questioned by some, whether Mr. Johnson has any right to a patent at all, even for his flat plate pantascopic camera. But when a man claims what is obviously not his own, as he has done, in the pages of a contemporary—when he said a clock-work, &c., &c., described by myself, was "that actually sold with the pantascopic camera," when even a careless reader would see that it was not so—in such a case I say he is likely not only to lose somewhat of his reputation, but also some of the merits which he justly deserves.

I asked a number of questions in the pages of your contemporary, with the view of ascertaining upon what grounds a valid patent could be secured for the use of talc plates in a pantascopic camera. These questions, however, Mr. Johnson did not condescend to answer, not from want of time either, as he proved in the letter which he wrote after reading them, by making a most unwarrantable attempt to drag forth my real name from beneath the cover of my anonymous signature. Surely, sir, as a gentleman, I have a right to be anonymous if I please. You well know that I have used the anonymous in writing when there has been no likelihood either of provoking discussion or of feeling shame for what I have written. Nor is the anonymous peculiar to myself. The greatest, as well as the meanest of men make use of it, and princes and emperors travel incognito. Mr. Johnson says, "the ordinary form of this (the tent plate) camera, with its curved plate-holder and focussing glass, is very expensive to construct." Why this should be so "I can't make out," for with such materials as vulcanite, ebonite, gutta-percha, &c. &c., surely a curved plate-holder might be made at something like a reasonable cost. As to the curved focussing glass,—has Mr. Johnson been manufacturing pantascopic cameras in such quantity as he would have your readers believe, when he tells them that he has furnished ten to Mr. Somebody or other, and still be unaware of the fact that no focussing glass is used with them? Has Mr. Johnson forgotten his oft-repeated statement, that "no focussing is required"? Even if a focussing screen *were* required, does not Mr. Johnson perceive that it might be made from pieces of talc joined together, and covered with Ag.I. or Ba SO_4 at cost of less than a shilling? or would he call that which costs less than a shilling "very expensive"? He tells us in his next sentence, "If the fine atmospheric effects of the pantascopic camera be desired the motion *must* be automatic."

I deny the correctness of this statement, and re-assert of the arrangement I described in my last, that "it will require but little skill to produce an equable motion by this means, and obtain fine atmospheric effect." At the conclusion of his third paragraph, Mr. Johnson says, "But the nature of talc, as you truly observe, will limit this form of instrument to plates of very small dimensions." Allow me to correct this statement.

1stly. You never made the observations which he charges upon you. Your words run thus:—"We fear that it would be found difficult to get plates of mica sufficiently perfect, and sufficiently large."

2ndly. The observation, by whomsoever made, is incorrect, for, as you *did* "truly observe, large plates of mica, perfect enough for photography, *can* occasionally be obtained."

3rdly. As I have already shown, mica need not be used at all.

In his fourth paragraph, Mr. Johnson states, "With respect to the distortion of panoramic pictures when viewed flat, I would observe that if persons who entertain the views of your correspondents will," &c., &c., &c.

This statement is altogether out of place.

1. Because in your columns I never expressed any views "with respect to the distortion of panoramic pictures."

2. Views which have never been expressed in your columns are views with which your readers cannot reasonably be expected to be acquainted,

3. Views with which your readers cannot reasonably be expected to be acquainted are views which we have hardly a right to suppose any of them entertain.

4. An appeal to persons who entertain those views is in your columns altogether out of place.

At the end of his fourth paragraph Mr. Johnson says, even in those cases in which the distortion is gross and offensive, "the distorted view may still be used by architects or artists to furnish the materials of a picture."

Surely this statement "deserves only to be mentioned that it may be despised," for "the greatest tyro in photography knows, or ought to know," that the object of a photographer is to produce a perfect picture himself, and not to produce a distorted view (which) may still be used by architects or artists, to furnish the materials of a picture."

The last sentence of his fourth paragraph is one to which I may revert some other time. His fifth and sixth paragraphs, after what I have already said, deserve only that I should treat them with "silent contempt."—I am, sir, your obedient servant, X. Z. C.

Manchester, July 22nd, 1865.

Sir,—In the last number of your Journal X. Z. C. H. K., &c. &c., furnishes you with some details of *his* (!) pantascopic camera. In doing so he proceeds to give you a drawing identical in form with the panoramic camera invented by Martens, of Paris, more than twenty years ago, and of which you will find a description and figures in every price list published by Lerebours and Secretan, and in most ot the earlier treatises on photography. The only modifications which your correspondent has suggested are—

1. The mode of effecting the revolution of the lens by means of a string, pullies and lever, instead of the much more mechanical tangent wheel and screw of the original inventor.

2. The use of automatic means for effecting that revolution.

3. The substitution of mica or other flexible material for the best Daguerreotype plate of Martens.

Your correspondent has been anticipated in both the latter modifications of Marten's camera, as will be seen from the following extracts from the specification of the patent granted to me and Mr. J. A. Harrison, September 1862, a copy of which I send herewith, and which was formerly published in your Journal.

Our invention consists of certain improvements in apparatus for taking photographic panoramic pictures. It is well known that if a photographic lens be mounted vertically upon a pivot, the centre of which coincides with a vertical line passing through the true, that is, the optical centre of the lens, and if such lens be made to turn upon a pivot, the images of the objects which are brought in succession in front of the lens during its revolution may be projected upon a screen placed behind the lens, and if such screen be part of a sphere, or (for practical purposes) a cylinder, the radius of which is equal to the focal length of the lens for the images so projected, and the centre of which coincides with the centre of the pivot upon which the lens turns, such images are true representations of the objects, and remain stationary upon the screen, notwithstanding the motion of the lens. Cameras thus constructed have been used for producing panoramic pictures upon curved Daguerreotype plates. It is also known that if, instead of the curved plate for receiving the images, a flat plate be employed, and if while the lens and the base upon which it is mounted and which carries the plate revolve, the plate be made to transverse in the opposite direction, with due relation to the rotation of the lens, the images projected upon the plate are likewise stationary, and are for practical purposes sufficiently sharp and defined, provided that but a narrow portion of the plate is used at one time, for the true images are projected upon a curved surface, and the plate is only a tangent to that curve, and cameras formed upon this principle have been suggested for the production of panoramic views, but, so far as we are informed, have not come into practical use. Now, the object of our invention is to render both the above-mentioned forms of camera fit for use with the modern processes of photography.

Our improvements consist, first, of an improved construction and arrangement of the parts of the flat plate camera, so that their motions are smooth and equable and free from vibration, and so that the whole apparatus is rendered more compact and portable than those previously suggested.

Second, of a new mode or modes of obtaining the relative motions of the lens and sensitive plate, such motion being obtained directly by mechanical means or by appliances constructed mechanically instead of by "guide curves," or "grooves" formed "by trial" as has heretofore been proposed to be done.

Third, of an improvement in the gearing when working both forms of camera.

Fourth, of the application of a spring or weight to give motion to such cameras, and of means for regulating such motion both at variable and invariable rates.

Fifth, of the application of an expanding diaphragm to regulate the "exposure" in cameras moving at an invariable rate.

Sixth, of an expanding diaphragm to be placed between the lens and the sensitive plate by means of which "sky and cloud" effects may be obtained, and by which the amount of exposure may also be regulated.

All the improvements which we have described for giving more uniform motion to the apparatus, and for regulating the exposure and the amount of light to different parts of the picture are applicable to the circular plate camera with a rotating lens as well as to the flat plate camera. The circular plate or "Marten's" camera is described in several works of photography usually as applied to be used with curved Daguerreotype plates. This form may be used for sensitive paper, and other processes on a flexible material, as talc, gutta percha, &c., by using a thin plate of metal having a narrow frame of metal attached to it by a hinge. The paper or other flexible material is placed between the plate and frame, and the latter is fastened to the former, retaining the paper, &c., straight between them. The whole may then be treated as a Daguerreotype plate, and bent to the proper curve in the camera, or the paper or other material may be upon rollers, and be stretched over the back of a curved frame, a portion being brought forward for each view. For glass plates a dark slide must be attached as in ordinary cameras, but made of the proper curve. The narrow tube which rotates in this camera and limits the angle of the rays acting upon the plate must be fixed upon the pivot under the lens instead of the camera itself in the flat plate arrangement. The end of the rotating tube must be fitted with our expanding diaphragm, and if a fixed rate of motion be employed the lens must have an expanding diaphragm in front of it. As the force required to cause the inner tube to revolve is much less than that required for the various moving parts of the flat plate camera, a weak spring fixed on the pivot is sufficient to give the motion.

If the arrangement shown in plate 3 be used for giving motion to the tube, provision must be made for rewinding the spring. This should be attached to the rest of the apparatus by a rachet, so that the spring and shaft alone move backwards. An arbor or shaft may be fixed upon the board carrying the lens, and be extended through the top of the fixed camera, and a key or thumbscrew be there applied for winding a spring, and moving back the rotating tube.

When I add, that X. Z. C., &c., &c., is a very young gentleman lately in the service of the Pantascopic Company; that while so employed he must have become acquainted with the subject matter of that specification (for he was informed that it was proposed therein to use curved mica plates, and a printed copy of the document was frequently afterwards seen in his hand); that he was also aware that a modification of the mica plate camera was being made for Mr. W. H. Price of Newington Causeway, from my design; and that he was employed by me to verify the focus of the lens to be employed with it; I think that your readers will agree with me that by no possible figure of speech can he call the instrument he has described "my camera," unless by that figure by which *lucus* is so called *à non lucendo*.

I recognised X. Z., &c., from the first, notwithstanding the signature of seven letters, not one of which is contained in his name, and he lately signed that name in full to a short communication addressed to a contemporary Journal; but I respected his incognito, detesting all personal discussions. The flippant insolence of his last letter shews me that he cannot appreciate, and is, indeed, unworthy of my forbearance.

In his letter in your columns and elsewhere "X. Z. C.," &c., has referred to and quoted from my correspondence with "Architecton" printed in the News a few months ago. The signature "Architecton" was by many persons attributed to Mr. Cole, one of the members of the Council of the Photographic Society. I never entertained that opinion; the ignorance (the ratio of the diameter of a circle to its semi-circumference was stated to be as 12 : 20). the unfairness, the gross personality of those letters convinced me that my opponent was neither Mr. Cole nor any educated gentleman. I have Mr. Cole's assurance that the discredit of the authorship has caused him much annoyance, and I promised to publish his disavowal on the first occasion that presented itself.—I am, sir, yours, &c., J. R. Johnson.

THE FORCE OF IMAGINATION.

Sir,—I hope sincerely the day is not far distant when society will have become so awakened to the wonderful ingenuity of modern inventors that it will blush even deeper than superannuated old collodion himself if there yet remain throughout the kingdoms a spot undedicated to those transcendant luminaries.

But what shall I say of photographic inventors? Who will give me words to pourtray the powers of *their* semi-omnipotent intellects? Talk, if you will, sir, of poets and their creative faculties and that fertility of imagination by which they are enabled to people uninhabitable regions with fairies and spirits reflecting the bliss of Paradise, and yet you will have fallen short of that force which the photographic inventor can with the greatest facility command.

What were the conceptions of Archimedes in reference to the cylinder when compared to his as we see instanced in the improved pantascopic camera?

But my object now, sir, is not to discuss the machines produced, but to give you, as it were, a speculative idea of the great *stretch of imagination* a photo inventor may lay claim to. To render my proposition incontrovertible, then, I had better at once advance my proof.

It will be practical, sir,—it will be personal. Mine is the imagination. I am, alas! the victim. The following are the particulars, but I must premise that you are indebted to the letter in your last issue from Mr. Macfarlane of Leeds, for their publication.

About two months since I imagined—astonishing how vividly—that I knew the Mr. Fletcher of Bradford Mr. Macfarlane spoke of; that he called to see me about taking him a negative; that we conversed about pantascopic cameras; that I told him the subject of a conversation I had with a few gentlemen amateurs respecting a circular camera, cylindrical construction, with flexible ground for receiving the picture, &c.; that we agreed he was to prepare drawings, to submit them to me, and that we were then to work them out together. I also imagined that he made use of the words, "Keep it to yourself until we get it out," and that then there was a long pause—a long wait for drawings, and none forthcoming, and that the next thing I heard was that Mr. Fletcher had been exhibiting *his circular pantascopic camera*, of my invention and suggestion, to some gentlemen in London. Now, sir, what say you? Was not this a forcible coincidence of my *imagination*, and was it not sufficiently curious to warrant me in submitting it to the scientific amongst the readers of your valuable Journal? Mr. Macfarlane will say, no doubt, "It is all imagination"—*fiat*—he cannot be displeased with me; I am only recording the effects of a *very wonderful imagination*, or communicating intelligence from some spirit with which I must be unconsciously *en rapport*, and as I do not wish to be either selfish or egotistical, I cheerfully hand over (after this) all real and imaginary honours through Mr Macfarlane to Mr. Fletcher, requesting that you, sir, for your trouble, in the words of the immortal Cap'n Cuttle, will "stand by, overhaul, and make a note on"— Fiddlesticks.

Bradford, July 25th, 1865.

Talk in the Studio.

North London Photographic Exhibition.—Intending exhibitors should bear in mind that all pictures, &c., intended for exhibition must be delivered on August 3rd or 4th at the Agricultural Hall, between eight in the morning and six in the evening at the Barford Street entrance. Each frame should have the name and address of the photographer at the back. A circular and form, with all proper details, can be obtained (should it not already have been sent) from Mr. Barnett, 12, Ockenden Road, Southgate Road, N.

Photographic Piracy.—A correspondence has just taken place in the *Leicester Chronicle and Mercury* between Burton and Sons and J. and T. Spencer, both photographic firms in Leicester, in which the former complains of the latter for pirating a series of election photographs issued by the former. To this complaint Messrs. Spencer rejoin:—"There can be no *piracy* where there is no *copyright*; and had Messrs. Burton been desirous of reserving to themselves the exclusive right of producing these portraits, they could have readily done so by the usual method of registration. As Messrs. Burton did not do this, we availed ourselves of these portraits, they being the only ones at hand suitable for our purpose; and this we did without any scruple, as it is a very common occurrence for photographers to copy portraits that are not especially protected by registration." Now, whilst it was doubtless foolish of Messrs. Burton and Sons to neglect the proper steps for securing their copyright, it is rather cool of anyone to avow that they appropriated the unprotected property without scruple, and we hope that such appropriation is less common amongst photographers than the paragraph quoted suggests. Messrs. Burton and Sons conclude the correspondence by saying they should have thought that the copyists "would have hesitated before so publicly announcing that their notions of honour and justice are merely bounded by the law." We should have thought so too.

Berlin Medal for Photographic Vessels.—We understand that the medal announced in our columns last week as awarded to Schade, Kistemann, &c., for photographic vessels, was awarded for the various photographic appliances in vitreous ware and earthenware of Messrs. Edwards and Son, of Dalehall Potteries, recently noticed in our pages.

Exhibition in Belgium.—The president of the Belgian Photographic Society announces a photographic exhibition to be held at Courtray, on the 20th of August, and solicits the co-operation of foreign photographers.

Paris Exhibition.—The Paris Phothgraphic Exhibition appears to be remarkably successful; the number of visitors during the month of June exceeding those admitted during May by 280, being 3,657 in May, and 3,887 in June.

Photography at Wimbledon.—A photographic series of prizes have taken position amongst the sources of interest at the annual gathering of volunteers at Wimbledon. The *Times* says:—"The contest for the photographic series excited great interest, the album, value 50*l*., annually given by Mr. Herbert Watkins, and containing photographs selected for their relation to rifle shooting and to the Volunteer service, being accounted by prize-winners one of the most interesting *souvenirs* of Wimbledon that they can carry off. Mr. Watkins aims chiefly at perpetuating what may be called the historic groups of Wimbledon, and his gallery of celebrities some years hence will possess considerable value. Mr Vernon Heath chooses rather to reproduce the natural features of Wimbledon, and some of his photographs of the wilder portions of the Common are admirable studies of nature, and very superior to ordinary photographs of the kind. A favourite subject in the collection was the firing-point for the "Horatio Ross" prize.

A Mystery Explained.—Mr. E. Bookhout writes to the *American Journal of Photography* as follows:—About nine months ago, I was engaged in making a lot of negatives from steel engravings; and, as I finished them, I placed them in the sun to dry, previous to varnishing them. There was one in particular that pleased me, and after it had drained for a few moments, I took it up to look at it, when, to my disappointment, I discovered a regular curved line, running nearly across the plate, of small oval indentations, little less than 1-16th of an inch long, and 1-3rd less in width, all of them as perfect as though they were made with a punch. Being somewhat addicted to hydropathy, I flew to water for relief, feeling confident it could do no damage, and gave my negative another washing. The result was perfectly satisfactory, for the trouble disappeared, but I could not satisfy myself as to the cause. So the matter rested till to-day, when, while examining an under-exposed negative, with a black cloth held under it, a fly lit upon the upper side and walked across one corner, leaving precisely the same markings in the collodion film wherever its feet came in contact—water, as before, brought them up.

Salting Paper.—M. Couvreux recommends that positive paper be salted with chloride of calcium in lieu of chloride of sodium or potassium. During the toning of proofs prepared with these latter salts, double chloride salts are formed, which are injurious to the proof, while paper prepared with chloride of calcium may be easily purged of the excess of alkaline base after passing through the silver solution, and cannot produce a double salt during the toning process.

Angle of Vision.—Although we derive so much pleasure and obtain so much knowledge through the sense of vision, very few persons are really acquainted with the powers and peculiarities of the eye. Thus our range of vision is bounded by the objecting parts of the face. In relation to this Dr. Alfred Smee says:—"If the eye be steadily directed toward one point, it is sensible of the presence of objects over a vertical range about 121° and a lateral range of about 149°." But perfect vision is only obtained over a range of about 2° 18′ which in practice is in the relation to the distance of the object to be viewed as 1 to 25. Thus at 25 inches distant, a person will be enabled to read a word one inch without the slightest motion of the eye, and at twelve inches distant a word half an inch long may be read in the same way. Where the optic nerve penetrates the eye, the retina is insensible to light, which causes a total loss of vision over about 6° 20′—the commencement of the insensible spot being 12° from the centre of vision. As the result of this there is a portion of the field of view, equal to one-eighth the distance of the object, which is utterly lost; and though it seems at first thought incredible, it is nevertheless true, that in regarding a range of hills eight miles distant, one mile of the range is not perceived by the eye.

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To Correspondents.

James Marsh.—The india-rubber sheeting which you enclose is vulcanized, and particles of sulphur may readily be separated from it. These would be apt to produce spots on silver prints, and therefore it should not be used for a hypo dish unless it be thoroughly well varnished afterwards. You can obtain india-rubber sheeting which is not vulcanized. Or a wooden trough, varnished with two or three coats of lac varnish, would answer the purpose without the india-rubber.

G.—We have found that coating the opal glass for about one-eighth of an inch all round with dilute albumen kept the collodio-chloride from leaving the glass. Mr. Robinson, of Dublin, who is working the process successfully, informs us that he finds the best plan to consist in the application of a solution of bees'-wax to the edge, *after* exposure, just before toning and fixing. 2. It is possible to print on opal glass in the camera. This may be done directly by giving sufficient exposure to a bright light, or giving less exposure and developing as recently described by Mr. Swan in our pages. We cannot state the exposure, having made no experiments personally in this direction. The mode of proceeding would be the same as that for camera-printing of transparencies. We will hand your card and stamps to our publisher, but you have not read the instructions for registration carefully, or you would have ascertained that it is necessary to send a form properly filled up and fifteen stamps. You will best obtain details by a reference to our Year-Book.

R. T.—The principal light should reach the sitter from the north, and a the end facing the sitter should be opaque, it follows that the side-light should come from the north. As the east end will be opaque, the house standing to the east of your studio will not trouble you much.

Organic Matter.—We prefer white glass to blue for the studio. A triple lens is one of the best for large groups, especially if you have light enough.

R. C. H.—Monohydrated nitric acid is nitric acid in its most concentrated liquid form, that is, possessing only one atom of water. Pure anhydrous nitric acid is in the form of colourless crystals. 2. M. Monckhoven does not describe his simpler method of preparing the nitro-glucose. It is probable that you used the acid containing too much water, which would tend to produce the decomposition and evolution of nitrous fumes. You can probably obtain the nitro-glucose of a manufacturing chemist.

Malheureux.—Do you clean the glass carefully, and use that with a polished surface? We have found the tendency in the film to split when opal glass with a ground surface has been used. See answer above to "G." 2. The other process to which you refer is with wet collodion and camera printing. It has been recently described in our pages; but is more troublesome and generally less efficient than the collodio-chloride process. 3. You will find one or two processes on ivory described in our last Year-Book, and another process described in our number of the 3rd of February last.

Vitreous Photographic Ware.—Referring to an answer in our last we learn from several quarters that there are various agents in London besides Claudet and Houghton for this ware. On enquiry, we find that the vessels are kept by Hughes, Rouch, How, Shew, Bolton, Cooke, Wood, Bailey and Son, and Fallowfield and Co. The addresses and other particulars of these houses will be found in our advertising pages.

F Ward.—We have not had much experience with the paper you mention, but such as we have had is decidedly favourable. 2. No one developing formula is suitable for all occasions. You will find formulæ with detailed hints as to their application in our Year-Book. 3. The same of intensifying solutions.

R. K. Fletcher.—The stains on your negative undoubtedly arise from something dropping on the film—possibly drops from the bottom of the developing cup, or possibly splashes on the plate from pushing down the shutter of the dark slide with a jerk.

W. J.—Swing backs to cameras have various uses; but their most important purpose is in taking photographs of architectural or similar subjects in which the camera is tilted to get in the upper portion of the building. If in such case a swing back be used, so as to keep the plate parallel with the building, the uprights will not appear converging as they must otherwise do when the camera is tilted. 2. The No. 1 triple will cover a 10 by 8 plate very well when used in enlarging. 3. The dark-room may be lighted with a candle safely enough if the sensitive film be kept a sufficient distance from the flame. If it be necessary to use it close at hand, yellow glass should be employed, as a sensitive collodion film will be acted on by a candle flame. 4. We fear that the number cannot be obtained.

A. B. C.—We strongly deprecate the tendency to excessively low prices in portraiture, and always counsel every photographer to maintain his prices if possible, as the safest and most remunerative plan in the end, and the one most likely to ensure good work and maintain the dignity and progress of the art. We can understand that in cases of overwhelming competition photographers are compelled in self defence to work at a lower rate than they would otherwise do. Of such cases each photographer must be himself the best judge how far they apply to himself.

J. Marsden.—The negative employed was most probably iron developed; and the print has the appearance given by lime toning.

B. F. L.—There are various causes for the ebullition and discharge of nitrous fumes in making pyroxyline. A common cause is having too much water in the the acids. Putting too much cotton in the mixture has practically the same effect; allowing a portion of the cotton to protrude beyond the surface of the acids will also cause it. When it appears, punch the cotton well below the surface and add a little more sulphuric acid, which will take up the water. 2. About ten minutes is sufficient for immersion in the acids. 3. We lift the whole of the cotton out of the acids, between two spatulas, squeezing the acids out from the mass as much as possible, throw it into a large pan of water which is kept standing for the purpose, and quickly pull the cotton apart, separating it and dispersing it through the water. If the quantity of water be small, and the cotton be not rapidly separated, the rise of temperature and dilution of the acid produced will cause a good deal of the cotton to be dissolved. 3. After washing well, add a few drops of ammonia to the water, and then wash well again. 4. Equal parts of the commercial oil of vitriol and nitric acid, 1·420, two drachms of wool to six ounces of mixed acids, temperature about 150°. The increase in weight will be from 30 to 50 per cent.

Working Photographer.—The panoramic camera you saw at Wimbledon is doubtless, from your description, Johnson's Pantascopic Camera.

One in a Fix.—You had better try a new bath. The condition of the bath and film would not, however, as you seem to imagine, affect the sharpness of the image. 2. Negatives intensified with mercury are very apt, if the exact conditions are not observed, to become transparent on varnishing. We never counsel inexperienced photographers to use mercury. To avoid the risk of this transparency do not apply the mercury long enough to make the image white—do not let it get past the grey stage. It is only through many failures that anything like a good understanding of the capability of mercury-intensification is obtained, and it is very doubtful whether it is worth while going through so much to gain so little.

G. R. P.—The yellow discolouration of the half-tones in your print is due to intense sulphurization, doubtless from acid hypo.

A Bungler.—We submitted your letter to Mr. Sayce, who appends the following note to it:—"The tannin process with simply bromized collodion and 60-grain bath is not adapted for iron development. Filter your collodion before use, and when using a newly made sample allow the film to set a shorter time than older collodion requires. Your note is not sufficiently explicit."

Nelson K. Cherril.—Thanks. The communication will appear in our next.

J. Jones.—If you had stated what toning bath you had used we could probably have helped you. It is evident from some cause the toning bath is inert.

Young Subscriber.—The stains are either caused by a defect in the paper, or scum on the bath, most probably the latter. Draw a piece of paper over the surface before floating the first sheet of paper. 2. What kind of sensitive bath do you require?

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Registrations.—All Photographs sent to this Office for Registration are immediately attended to, and parties interested may venture to act upon this assurance. Our Publisher will endeavour to acknowledge the same in the News every week, and so avoid the correspondence occasioned by delay. This must be a sufficient answer to several letters now on hand.

Mr. Sam. Glen Payne, 3, Selina Terrace, Salisbury,
Photograph of "Election Time; or, I'm not myself at all."
Photograph of two Persons (Quintuple).
Messrs. Twyman Bros., Fort Parade, Margate,
Three Stereo Slides of Views of the Grotto in the Dune, Margate.
Mr. A. W. Cox, St. James' Street, Nottingham,
Ten Photographs of Scenes near Nottingham.
Mr. H. Mertens, 2, Oxford Terrace, Park Road, Clapham,
Two Photographs of Rev. W. Gooby.
Mr. Wm. Steele, Dudley,
Two Photographs of H. B. Sheridan, Esq.
Mr. Thos. Jones, Aberavon,
Three Photographs of Margam Park, Glamorganshire.
J. Russell and Sons, Chichester,
Four Photographs of Bishop of Oxford.
Mr. F. Downer, Watford, Herts,
Photograph of the Earl of Essex and his Dog.
Mr. E. Cothell, Assembly Row, Mile End,
Photograph from Engraving of "The Church Choristers."

THE PHOTOGRAPHIC NEWS.

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MODES OF COLOURING PHOTOGRAPHS.

POWDER COLOURS FOR PICTURES ON PAPER OR OPAL GLASS.

It is probable that as the rage for card portraits declines, a taste for coloured work will revive. During the card mania the chief tendency was to diffusion; the public wanted numbers, and numbers at a cheap rate, the demand for coloured portraiture being thus necessarily reduced to a minimum. What may be the next photographic epidemic we cannot say; but it is very probable that a steadier demand for coloured pictures will prevail than has obtained for some years. The portraitist with a sufficiently large establishment to engage a colourist on the premises, and the photographer who lives in a large town, and has therefore ready communication with the professional colourist, will find no difficulty in meeting the demand. But the provincial portraitist, and the amateur photographer, often need and desire the power to tint a picture at a short notice and with a moderate expenditure of time, and a limited amount of manipulative skill with the pencil. With a view to meet the wants of such, we propose devoting a few articles to instructions for producing the best results in colouring by the simplest means.

The mode of colouring making least demand on the skill of the colourist, and presenting little risk of spoiling the likeness, is that effected by colours in a state of powder. It is true that the highest artistic results cannot be obtained by such means, and they are, moreover, unless protected by glass, very readily liable to injury. Nevertheless, some very pleasing effects may be produced, and, with proper care, a fair amount of stability secured.

Many photographers are familiar with the use of powder colours as applied to Daguerreotypes and to collodion positives, but, as is well known to those who have tried to apply these colours to paper, there is a great difference between the surface of an albumenized paper picture and that of a Daguerreotype or collodion positive. Either of the latter present a kind of tooth to the colour, which adheres in much the same manner as crayons to the surface of rough drawing-paper. The glazed surface of the albumenized print presents no such tooth, and the colour does not adhere sufficiently to permit any degree of brilliancy to be attained, and it is so easily disturbed or wiped off, as to be, under ordinary treatment, comparatively useless.

Nevertheless, the facility with which powder colours may be applied, with a moderate amount of skill, and the small risk there is of removing the likeness when such colours are employed, have rendered it desirable that some method could be devised of securing the desired tooth to make the colour adhere. Fortunately, this can be done in two or three ways. The first and simplest, although perhaps the least efficient, consists in treating the mounted picture with Claussel's encaustic paste, prepared by Messrs. Bailey and Son, in the mode directed in the instructions for its use This method consists in applying a little of the encaustic to the surface, and then polishing until no trace of it remains, the only apparent result being an increased depth and transparency in the shadows of the picture. But if powder colours be now applied to the print, they will be found to adhere very satisfactorily. It will, however, also be found necessary to cover the print with glass, or the powder colours will be easily removed by rubbing.

A better and more efficient plan of applying the same colours will be found in the next method we shall describe, by which we produced, some years ago, some very excellent results. The albumenized print, having been mounted and rolled, is varnished with a light-bodied adhesive varnish. We have used both the alabastrine varnish sold by Squire, and the positive colouring varnish of Newman, both of which are applied without heat. and dry without gloss, leaving the picture, indeed, scarcely altered in appearance. But on applying the powder colours, it will be found that the print has acquired a surface to which the colours readily adhere, and produce a very brilliant result. The more taste and skill possessed by the colourist, the more effective he may make his picture. It should be remembered that a universal application of flesh tint to the face, without delicate greys to blend lights and shadows, will yield but a crude result. The better and purer the colours, of course, the more brilliant, if judiciously applied, will be the finished picture. In experimenting with this mode of colouring, we used Newman's Powder Colours, which were very satisfactory. When one application is complete, if a more forcible or vivid colouring be desired, the varnish may be applied again, and the colouring repeated *de novo*, and it will be found that in the second painting the colours adhere much more tenaciously than before, and require the greater care in applying them, as the more perfectly they adhere, the more difficult it is to remove superfluous colour, or to obliterate the effect of carelessly applied touches. When the colouring is complete, the picture should be preserved under glass; or, if the photographer prefer it, the surface may be coated with a strong-bodied spirit varnish; we used Newman's "Penetrating Varnish," which is poured over the picture in the way in which glass is coated with collodion, heat being employed. The result, if well managed, is like a highly-finished miniature in oil.

Amongst the most perfect results produced by applying powder colours to paper photographs are the examples by M. Mansion, by a special method, analogous to that we have described, but for which M. Mansion prepares especial materials. Mr. Solomon, of Red Lion Square, some time ago, called our attention to some charming specimens, and requested us to try the preparations and colours employed, which we have recently done with very complete satisfaction and success. The mounted print is first flooded with "Mansion's Preparation" in the same manner as a plate is coated with collodion; when dry, no perceptible change is apparent in the picture, but the preparation has given a capital tooth to the surface, by which the powder colours are held satisfactorily; every touch adheres perfectly, and appears as firm and as vivid as that of a coloured crayon on prepared canvas. When the colouring is completed, if the picture be warmed before the fire, the colour already applied is by means of the heat more perfectly incorporated with the surface, and a fresh coat of colour may be applied without disturbing that just completed. When the necessary force and vividness are acquired, the effect of a miniature coloured in oil may be produced by finishing the picture with a varnish Mr. Solomon supplies for the purpose, which is easily applied and very effective. Few persons who have worked with dry colours can have any idea of the rich and brilliant effect easily attained by the method and materials we have just described.

By the methods we have described as applicable to paper prints, it is possible to produce some exquisitely beautiful results with collodio-chloride prints on opal glass, the delicacy and brilliancy of the pictures giving an amount of purity and force to the colours not attainable in any other class of photographs. The absence of apparent manipulation, such as hatching, stippling, &c., gives to a well-coloured picture with powder colours very much of the suggestion of the photograph having been produced in colours.

It is not our intention here to enter into the details of manipulation in colouring with dry colours. These are simple and easily attained with a little practice by persons possessing taste in this direction. Complete instructions will moreover be found in our first volume, as well as in various published manuals. But it is important here to remark that this mode of colouring is only applicable to moderately good photographs; pictures that are ill defined, or which have stains and spots, or black, heavy shadows, &c., are *not* suitable for this mode of colouring, as the image is not covered up or obliterated, but remains intact in all its drawing, light and shade, &c., simply receiving the addition of colour. The print should be as sharp, well-lighted, and free from spots, and generally perfect as possible; it should also be warm in tone, and not too deeply printed, in order to produce the best results. Where the photograph is imperfect, and requires its defects to be covered up, or its drawing altered, water colours or oil must be employed, and these by a skilled artist. We shall refer to the use of aniline colours in our next.

PHOTOGRAPHS IN THE DUBLIN INTERNATIONAL EXHIBITION.

[SECOND NOTICE,]

It is, with such an epitomized catalogue, and the generally scattered arrangement of the pictures, somewhat difficult to classify the pictures in this exhibition. We shall commence our notice, however, with a general glance at the coloured work, of which there is a somewhat extensive display. Amongst the best examples of colouring are those exhibited by the United Association of Photography, the prints being produced by the Wothlytype process. The coloured paper prints are many of them very charming, and those on ivory doubtless have been; but it unfortunately happens that, from some unexplained cause, many of them have suffered much discolouration in the flesh tint, altogether marring the pictures. As the paper pictures of the same exhibitors are as perfect as can be desired, it is but legitimate to conclude that some want of care, or probably still some want of perfect familiarity with the necessary conditions in applying a new process on ivory, has caused this discolouration. Probably some portion of the fixing salts may have been left in the picture when it was placed in the hands of the colourist, and the reaction between these and the pigments used in colouring may have caused this untoward result. As we were the first to suggest and apply the uranized collodion process to printing on ivory, we feel the more interested in this result, the explanation of which will be interesting. Messrs. Lock and Whitfield exhibit some exceedingly charming examples of coloured work; the four portraits of Her Royal Highness the Princess of Wales being in all respects satisfactory and perfect work, free from the defects which have often characterized the most elaborately manipulated style of water colour painting applied to photographs, in which the excess of high manipular finish has often obliterated nature and substituted for it a mere display of namby-pamby prettiness. The resident Dublin photographers contribute some good specimens of coloured work; but we find in some of the contributions an unfortunate tendency to the fault of which we have just spoken, derived from the practice of the old miniature painters—the tendency to produce unnaturally large eyes, foolishly small mouths, and a general doll-like effect. Mr. Cranfield, of Grafton-street, exhibits some exceedingly good coloured pictures, but a few of the kind to which we have referred have crept amongst his specimens.

Amongst the Dublin exhibitors we notice the name of Schroeder, and amongst the specimens connected with his name we recognise some of the pictures of the late Mr. Lacy, of Ryde, with whom a person of a similar name as this exhibitor was once a printer. We presume that it is impossible to adopt any plan to prevent a man exhibiting as his own work the productions of another, which he has chanced to become possessed of; but the evil, although, we hope, not common, certainly requires a remedy.

Also, amongst Dublin contributions, we find a frame of coloured prints from the Queen's Institute for the Training and Employment of Educated Women. We looked at these with considerable interest, hoping to find evidence of the suitability of this class of work for affording employment to ladies of culture, thrown by adverse fortune on their own resources for an income. We were doomed to disappointment; the colouring was very inferior, and the pictures altogether poor and unsatisfactory. We may mention here, however, as the work of a lady, Madame Mansion, a frame of exceedingly charming pictures, coloured with great taste and skill, we believe altogether with powder colours, by a method we describe on another page of the present number.

A novelty in coloured work consists in a frame of small pictures by Mr. J. E. Ross (late Ross and Thompson), of Edinburgh. These pictures are united by a kind of rustic frame-work, in which the various faces peep out from leafy bowers or sylvan nooks; the whole cleverly coloured, and having a pleasant rustic freshness of effect. Some of the coloured enlarged pictures which were exhibited here are very good. Amongst them we may especially note one by Mr. North, of Grafton Street, Dublin, some by Mr. Warner, of Ross, and one or two others. The Casket Portrait Company exhibit some samples of Mr. Henry Swan's patent miniatures, in which, by a clever contrivance already described in our columns, a portrait in relief is seen, without the aid of a stereoscope, embedded in a solid cube of glass, like a fly in amber. These specimens are coloured with great skill, and are amongst the most charming specimens of our art exhibited in Dublin. It is a pity that the circumstances of the exhibition did not permit these beautiful portraits a position where their beauties would have been better seen and appreciated.

Adjoining the last-named pictures are some very fine specimens of Messrs. Helsby's miniatures on opal glass, with recent descriptions of which our readers are familiar. On the same table are exhibited thirty-five specimens of photo-sculpture in the shape of medallions, busts, and statuettes, many of which are exceedingly beautiful, exhibited by the Photo-Sculpture Company. An exceedingly successful group is exhibited here, by M. Silvy, photographed on enamel, by M. Camarsac's process, which appears in M. Silvy's hands to have been perfectly successful.

On the same table M Beau exhibits an amusing conceit in the shape of "Revolving Cartes-de-visites," in which a card picture is framed so as to revolve on a centre, one side containing a front portrait, and the other a back view of the same person, mounted so as to accurately back the other. By the side of these we find a couple of small engravings referred to in the catalogue as specimens of a "New Secret Process of Oil Varnish, especially adapted for making double copies of engravings." No further information accompanied them, and, so far as we could see, they had no connection with photography. Some charming volumes of photographic reproduction by Gustav Schauer, and an album of very fine landscapes entitled *La Tour de Marne*, by M. Rousset, are on the same table; the contents of which are completed by a revolving pillar stereoscope, containing glass transparencies, by Johnson and Co., of Leamington. These did not strike us as so good as some larger pictures exhibited by the same firm. By far the finest stereoscopic transparencies exhibited here, or indeed that we have ever seen exhibited anywhere, are those found in Mr. Breese's stand of stereoscopes. The wondrous effects of sea and sky, and atmospheric moonlight effect, and sunlight effect, however produced, are unquestionably very beautiful, and remain still unapproached, and, in fact, without either rivals or competitors.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

A Letter from Ireland—The Magnesium Light and the Atlantic Cable—The Berlin Medals—The Pantascopic Camera—Photo-Binographs—Dr. Pritchard—The Simpsontype—Backgrounds.

A friend who has gone over to Dublin to see the Exhibition writes as follows, and is very anxious that I should do him the honour of inserting his letter in this column. It is not quite so complete a record of the Photographic Department of the Exhibition as he promised to send me before he started, but is interesting from a meteorological and psychological point of view, the prevalence of "Bulls" showing how soon the climate of Ireland takes characteristic effect upon strangers. Here is the letter:—

"Dear old Photo,—I have now been in these foreign parts of the United Kingdom more than a fortnight, and have discovered that it is, strictly speaking, *not* "justice to Oirland" to say that it *always* rains in the sister kingdom; there have been at least two days since my arrival on which I found it quite unnecessary to clothe myself in umbrellas.

"I need not send you any account of the Exhibition, although that is the object of my letter. Mr. Werge's contributions to the News tell you all about that, from Euston Station to back again, including the colonies, and I did hear a mysterious whisper that your Editor had been seen prowling about with a note-book, and had been taken for one of the jury in some instances by the confiding and captivating young ladies who superintend the magnificent cases sent over by the great manufacturers of photographic apparatus, and that they had exhibited their contents to him in the most enthusiastic manner, fully anticipating medals for their zeal. I had to explain to some of them that a nod from him was better than a wink from the jury, "pioneers and all." While on this subject, what capital salesmen Irish girls make! I shall have to be taken out of pawn before you get me back again. Bog oak brooches and Irish poplins are ruination when taken in quantity.

"If I have not told you what has been photographed, I will tell you what ought to be. I can't say fairer than that. Purely for the sake of finding "fresh fields and pastures new" for our English photographers, who have worn out the home pasture, I have taken excursions into the wilds. My exertions for the sake of others were well repaid with great enjoyment to myself; it is very well known that

> 'A thing of beauty is a joy for ever,

as long as it lasts, and I was sorry to leave so many things of beauty without being able to obtain any good reminders of them in the shape of photographs. It is true that some of the principal places have been 'done,' but I should like to see them done by Bedford, or Blanchard, or England.

> "'Not a smaller soul,
> Not Launcelot nor another.'

The most beautiful scenery near Dublin is the Glen of the Dargle, and Powerscourt Waterfall. The latter has been most exquisitely photographed by Mr. Breese, and I was surprised not to see a copy of it on his table of stereographs in the Exhibition. The 'Glen' is full of beauties, and, what is of quite as much consequence to the professional photographer, is a favourite place for stereograph-buying visitors.

"The most charming place in all Ireland, and the fullest of beauties photographically available, is Killarney. Mountains, glens, waterfalls, islands, lakes, and legends (the latter available for the backs of the pictures), picturesque figures, and salmon and trout fishing in the lakes for dull days, all combine to attract photographers to this beautiful spot, yet very few have availed themselves of its glorious attractions.

"I could tell you of other places, but after Killarney, if you knew it, you would exclaim with the player queen in Hamlet, 'confound the rest.'—Yours, &c., &c."

The magnesium light, but two years old, has made a rapid reputation, and has been put to many uses. It has enabled the photographer to penetrate to hitherto inaccessible places, such as the interior of the Pyramids and the Catacombs of Paris. The surgeon finds it useful in examinations with the speculum, and it is rapidly becoming utilized in a variety of most improbable ways. The most curious suggestion has been made during the last month, which is, that the Great Eastern, after having successfully laid the new Atlantic Cable, shall, on her return, pick up and recover the old one, which is now lying at the bottom of the ocean, by the aid of the magnesium light!

The jury of the Berlin Photographic Exhibition have awarded so many medals that their value is somewhat diluted. A universal distribution of medals might be very satisfactory to what Firmilian calls

> "Uninspired dullards, unpoetic slaves,
> The rag, and tag, and bobtail of mankind,"

or rather of photography, but the few who really deserved the awards feel that the speciality of the honour is weakened or destroyed by such general distribution. Medals have done much towards encouraging photography, and were worth competing for when their scarcity made them valuable. I would suggest to those concerned in such awards that although an excess of liberality is a failing which leans to virtue's side, they weaken the motive for effort when they permit merely good intention to receive the honours which should only be awarded to actual achievement of the highest excellence.

A good hot controversy is very pleasant to look upon this sultry weather. It is so refreshing to see others getting warm and feeling cool yourself by contrast. A long and angry correspondence concerning the Pantascopic Camera has taken place between "X. Z. C. H. K. F. F." (who in his later letters has kindly consented to sign himself "X. Z. C." for short) and the inventor, Mr. J. R. Johnson, with occasional pats on the back for each side from others. As neither side seems to know when it has written enough, and returns to the charge week after week, it is difficult to follow the involutions of the battle. The "difference" commenced by "X. Z. C." suggesting a cheaper kind of camera for taking panoramic pictures, which would necessitate the use of curved plates of talc or mica, at the same time stating that it is generally admitted that the productions of the pantascopic camera, when viewed upon the flat surface, are distortions of the truth, &c., &c. At this the inventor very naturally takes offence, and replies that numbers of views might be taken in which no distortion is perceptible, and in many cases the discrepancy between the curved and flat form is a positive advantage, and less than that given by the modern large-angled lenses, which I think is going a little too far to be readily believed, and so the discussion goes on apparently *ad infinitum*. It is certain, and is admitted by the inventor, that the camera is not adapted to every kind of photograph that can be taken, and in some instances, where it is improperly used, it gives very absurd results. I have in my possession a picture taken with one of these cameras which would induce you to believe that two suns were shining from different parts of the heavens at the same time, and casting distinct shadows in different directions. But the misuse of an instrument is no argument against the results obtained by it when used in a proper manner. Pope lays down an excellent rule for criticism equally applicable to poetry and photography :—

> " Whoever thinks a faultless piece to see,
> Thinks what ne'er was, nor is, nor e'er shall be,
> In every work regard the writer's end,
> Since none can compass more than they intend ;
> And if the means be just, the conduct true,
> Applause, in spite of trivial faults, is due."

And when it is considered that the object to be accomplished was the achievement of pictorial results, and not illustrations of plane perspective, it must be conceded that the pantascopic camera is a success. For pure landscapes, where an angle above 85° or 90° is absolutely necessary, no instrument has yet been invented to compare with this invention.

Another equally pretty little discussion has been going on to enliven this dull period of the photographic year (literarily not literally speaking) on photo-binographs. Mr. Pettitt is angry that all the world will not believe that his "binographs," or single pictures enlarged from two negatives, stand out as solid as a stereoscopic slide. He has not only invented the binograph, but he has discovered a way of dealing with his opponents which is very original. When he read his paper before the Photographic Society, several members, among whom were Mr. Mayall, Mr. P. Le Neve Foster, and Mr. Hughes, were desirous that Mr. Pettitt's very hetorodox optical notions should not go forth to the world as endorsed by the Society. In the News of the 23rd of June he makes an attempt to answer these gentlemen's objections to his theories; on the 14th of July he states that as these gentlemen are silent it is fair to suppose that they have become convinced that their assertions were premature and their theories untenable! This is one of the most curious instances of the misconstruction of silence I have ever met with; it being very obvious that these gentlemen in particular, and photographers generally, still consider the binograph as about the most astonishing hallucination that has ever troubled the brain of a photographer with a mania for invention.

When I saw a portrait of that greatest miscreant who ever disgraced the annals of science, Pritchard, I thought he was a handsome man, which goes far to prove that photography can flatter, for when his head was prepared for the purpose of having a cast taken of it, it was found to be so ugly, that Calcraft, who must be supposed to be a good judge of criminal heads, at once pronounced it "'orrid." Pritchard was fond of giving away his carte de visite, and must have been a good customer to the Glasgow photographers, as he seldom paid a first visit to a patient, especially if a lady, without exchanging cartes. It is possible, however, to have your portrait too much sought after, and attempts are being made to stop the sale of representations of the murderer.

The collodio-chloride of silver process on opal glass is now being employed in most of the large establishments; the exceeding beauty of the pictures being at once recognised by the public. I have been lately printing some of my old negatives by this method, and have been astonished to find beauties in them, rendered by this process, which I never before suspected.

The subject of backgrounds and accessories has again come up this month. In an interesting article, entitled "Art Hints for Photographers," in the Number of the News, June 30, "J. S. W." eloquently denounces the "curse of ornamentation" with which studio furniture is overloaded, and the absurd mistakes which are made by background manufacturers in the representation of scenes which are always before them. He recommends that photographers should operate upon the producers of such accessories, and compel them to produce better work; but, as he justly says, "while there are many who have adopted photography who claim to be artists from a certain acquaintance with the brush and the palette who, nevertheless, fail as much in the one as they never succeeded in producing anything worthy of note in the other, there are a still larger number who have taken to photography without any ideas or knowledge of art." This being the case, where are we to look for those who could put this pressure on the manufacturer? The wielders of the brush claim, by that token, (how erroneously few of them suspect), to be artists, and it follows that we should look for artistic work from them in the first instance, and not to the photographer they are so fond of calling mechanical. In the following Number of the News to that in which "J. S. W.'s" contribution appeared, "A Background Manufacturer" takes the subject up, and says that the demand for the monstrosities "J. S. W." described is very extensive, implying that photographers preferred tasteless backgrounds to artistic ones. This I cannot believe. The real secret is, that no artist with the requisite amount of ability has ever yet undertaken to paint backgrounds professionally. "A Background Manufacturer" is quite correct in saying—but I wonder that he owns it—that nothing better than "the very worst of country scene painters, the refuse painters of the little country theatres, the scenery of which has long been a standing joke," have been employed to supply photographers with backgrounds. There is no great art necessary in painting a background, the principal qualification being a knowledge of what a background should be, which knowledge does not yet seem to be possessed by the makers.

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SPLITTING OF THE COLLODION FILM.

BY NELSON K. CHERRILL.

Having bestowed much time on the consideration of this subject, I shall be well repaid if this communication tends in any way to throw light upon its causes and remedy. Before proceeding with my remarks, I should like to point out that this "unpleasing phonomenon," as generally observed, does *not* occur from *unequal contraction* of the film in drying; it may, in some instances, arise from this cause, but in these cases, I think that the *first* appearance of cracks would be in some direction definitely referable to the part or parts of the plate then dry or nearly dry. For instance, cracks would come all round a spot in a radial or some other regular form, probably, however, somewhat modified by the condition of light and shade in the film. This regular formation of cracks has never occurred in any instance which I have seen, nor do I know of anybody else who has seen it. They are generally distributed over a small portion of the plate in an irregular form, and they spread in most cases if heat be applied to the film.

The "Photographer from Yankee Land" has given many conditions under which "the phenomenon is most likely to take place," but in so doing he does not seem to have sufficiently clear a notion of the real absolute cause of the mischief, and therefore his directions for diminishing the "tendency to split" are, although they contain the true remedy, wanting in precision.

After much thought upon this subject, I have come to the conclusion that the splitting of the film is in almost all cases entirely due to one *main* cause, viz., *water getting between the film and the glass*; and taking this theory, all included cases of splitting divide themselves into one or other of two distinct classes, viz.—

1st. The case in which the water between the film and the glass is in small (infinitesimal) quantities much distributed over the film; and

2nd. When it is in sufficient quantities to be clearly seen in small patches of silver whiteness.

The first of these two classes may, I think, also be divided into two subdivisions thus:—

(a) A case in which the water between the film and the glass has been introduced in some of the processes through which the plate has passed, such as exciting, washing, &c.

(b) In which the water was on or in the glass when the collodion was poured on. (I remember some time ago in the News an account of some glass "sweating," thereby destroying several valuable transparencies, &c., of an eminent artist.)

Now, I think that every case of splitting may be referred to one or other of these classes. Class 2 being the one which I have most frequently met with, *especially when intensifying after a previous drying of the film, or after fixing without drying.* I have also observed that the film in this state (covered at the back with silvery looking patches of water between the film and the glass) *never* splits off until heat is applied for varnishing; this may or may not be owing to the fact that I use generally a somewhat rough sample of collodion; but as soon as the plate is made sufficiently warm to allow of the varnish being applied.

The whole film *opposite to the spots blows up* in some cases with violence. In one case a negative which I was warming before the fire blew in a instant all to atoms, scarcely a vestige of it remaining on the glass, and the greater part of the fragments went up the chimney. The great advantage of this manner of splitting is that you can always tell when it is going to happen, for I don't think that any film can be warmed without splitting if it has the spots to which I have referred, and I don't think any film will hurt, *when once dry*, if it is as clean and free from them on the back as it is on the front.

The remedy for this class of splitting is very simple, viz., coat the infected plate with alcohol before warming, and you will see almost instantly the whole of the bubbles will come through from the back to the front of the film, especially if the back of the plate is warmed while the front is still wet with alcohol. In general, however, this precaution is not necessary. The alcohol in this case acts merely by opening the pores of the collodion, and allowing the water to escape.

In considering the mode in which the water in the two subdivisions of the first case acts in removing the film, it must be remembered that as collodion is not at all sticky or adhesive, it owes its continuous attachment to the glass chiefly to *atmospheric pressure*, just in the same way as two plates of glass adhere when there is no air between them. Now it is plain that such being the case, the smallest possible quantity of water between the plate and the film being raised into vapour as the temperature of the plate increases, in drying would be quite enough to balance the atmospheric pressure, and that pressure once balanced the mischief is done, for then the thin delicate film may be injured in a thousand different ways. I have seen a film come off the plate in small pieces by just blowing gently upon it.

The remedy in this case is either to use gum or albumen, as has been proposed before, or perhaps alcohol and water, as recommended by the "Photographer from Yankee Land."

It may now be fairly asked, why does not the water in the second case blow up the film by counterbalancing the pressure, as in the first case? I can only answer that in the one case the film is only injured when it is very weak, whence the advantage of using gum, and that the other case—viz., when there is enough water to be visible at the back—can only happen when the film is of sufficient strength to resist the disadvantageous circumstances under which it is placed.

I think that it will be seen that all the conditions mentioned in your last number as tending to increase this evil tend also to increase the chance of water getting in, and all the remedies tend to its removal.

Belmont Lodge, Lee.

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ENLARGEMENTS FROM AMPLIFIED NEGATIVES.

BY ALFRED HARMAN.

A few words upon enlarging negatives will, doubtless, be perused with interest by your numerous readers, many of whom have doubtless felt the desirability of being able to obtain from a carte-negative that pleases the person for whom it was taken, a picture large enough for framing, that does not require any or very little touching up. And the amateur who has a store of stereo-negatives put away as out of date: what a pleasant thing for him to select some of his best subjects, and by a very simple process he can get a set of good-sized pictures that will grace his walls and be remembrancers of scenes visited long since.

There are many reasons why the method of enlargement I myself follow is so satisfactory and so much followed.

Firstly, any good printing negative will give a good enlargement; it only requires to be *sharp* and moderately soft. It cannot be denied that this is a very great advantage, for the persons most likely to have enlarged portraits are those who have had cartes taken with which they are much pleased. When assured that the enlargement will be an exact copy of the carte, they willingly pay the number of guineas requisite for such pictures.

Secondly, if the principles of the process are properly understood and followed, very little definition is lost in enlarging, and with careful and clear manipulation enlargements can be obtained very little short in detail and sharpness to the original negative. I allude throughout to *photographic* enlargements, not pictures that are covered all over with paint, so that no photography whatever is visible.

Thirdly, you by this process obtain a large *negative.* If any number of copies is required, there is the negative, from which any number of copies can be taken in the usual time and by the usual methods. Any style of printing can also be employed; defective backgrounds can be stopped out, and printed in separately; they can be vignetted, or, in fact, printed in any style or on any paper, as may suit the taste of the party concerned.

Talking of definition, I have sometimes obtained enlargements in my practice—which, by the bye, has by this time been something considerable—which possessed, upon comparison, more detail and better definition throughout than the originals. This has been when they have not been enlarged to any great extent, say from card-size to about 12 by 10 in. It is the case sometimes, when the original negative has been over-developed, so that when printing it, to obtain any detail in the lights, the shadows must be over-printed, thereby losing the detail that really exists in the negative, for, of course, if the detail does not exist in the original, it cannot be reproduced in the enlargement.

I suppose, after a while, we shall have the public catching the enlargement mania, and making photographers hunt up some of their old negatives for that purpose. How endless are the resources of photography! As fast as one fashion dies out another comes in to take its place and increase its importance and permanency as one of the principal branches of industry in the world.

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ON THE EMPLOYMENT OF COLLODION WITHOUT NITRATE OF SILVER BATH.

BY M. MC. A. GAUDIN.

Mr. Wharton Simpson has for some time past been engaged in researches upon the employment of collodion without using the nitrate of silver bath. This idea I was the first to start* some five or six years ago, and to the collodion thus prepared I gave the name of *Photogene.* I prepared this photogene with gelatine as well as collodion.

It is true that in undertaking my experiments, I proposed to employ the process principally in the production of *negatives,* and also that I suspended my researches for some time, because I could not succeed in covering the plates with collodion photogene, so as to employ them in the same manner as dry collodion plates. I now propose to state briefly the difficulties that stood in the way of my complete success.

Like the rest of the arts, photography obeys the law of progress, notwithstanding the appearances which at every period seem to assure us that we have nearly attained perfection. At every moment a new and unexpected improvement makes its appearance, and however trifling it may be, it is always a step in advance. Thus, in my opinion, the printing of positives in silver will certainly become, some day, only a phase in photography, as the Daguerreotype is. Collodion without nitrate of silver bath will, it is true, be only a simplification of this process; but every radical change is always preceded by *avant couriers.*

What can be more expeditious or convenient for negatives than the employment of photogene, if we knew how to prepare it? Immediately after pouring the collodion on a plate, we can place it in the slide and expose it, without having any dread of the nitrate bath, that inexhaustible source of failures! What, then, are the difficulties that stand in the way? Two principal ones, which doubtless Mr. Wharton Simpson must have foreseen without heeding them. One arises from the *impenetrability* of the collodion, which is due to its horny nature; the other is caused by the *agglomeration* at a certain moment of the iodide or the chloride of silver first held in suspension. For ourselves, in holding first to the collodion prepared with chloride of silver, the horny condition of the collodion presented no obstacle to the formation of a picture under the negative, but upon proceeding to tone and fix it, we were compelled to admit that there was no possibility of succeeding. This is so true, that nine times out of ten it has occurred to me to prepare photogene wholly insensible to the developer, because of its *compact* nature, which renders it *inaccessible* to any other reagent than light. Therefore, to obtain a chloride of silver collodion, the first thing to be done is to succeed in rendering the collodion as *porous* as gelatine and albumen naturally are; without that the process becomes chimerical.

It is quite as important to know the cause which determines the agglomeration of the chloride of silver, and if I may express myself, *turns* the collodion. It may be that the chloride, with which I have experimented very little, was not, in this respect, so susceptible as the iodide, which I have prepared perhaps a thousand times, without succeeding in preserving its opalescity (the sign of success) more than one time out of ten; for this agglomeration, it must be observed, takes place just at the moment when the insensible chloride or iodide of silver attains its sensibility.

Such are the reservations which it has appeared to me necessary to make in presence of Mr. Wharton Simpson's paper, so as to show that the process is not so smooth as represented by its present promoter.

[The two points raised by M. Gaudin are important ones, but they have presented to us no difficulties that were insuperable. We have pointed out from the first that a horny collodion was not well suited for the purpose. We have always used a moderately permeable sample, and when doing so have found no difficulty in toning and fixing. If a very horny collodion be used, and it have attained a very complete state of dessication before toning, we have found that the solution permeated with difficulty, and the toning was irregular. The whole of this part of the question depends entirely on the use of a suitable example of pyroxyline. The remarks we have made have reference chiefly to the use of collodio-chloride on paper; for it is a singular fact that samples of horny collodion which we have found unsuitable for paper, work exceedingly well on opal glass, without showing any impermeability or difficulty in toning.

The question of agglomeration or precipitation we have before referred to. We may simply repeat that we have met with no difficulty on that score, pursuing the mode of manipulation we have described since writing on the subject before; we have, however, by trying, secured a slight precipitation. This was effected by diluting a sample of collodio-chloride with ether until it was exceedingly thin and lost much of its glutinosity. A collodion of moderately good body is, it appears, then, desirable to prevent all tendency to precipitation. Our readers are familiar with the success of Mr. Sayce in preparing collodio-bromide for negatives.—Ed.]

◆

NEW INTENSIFIER OF CYANIDE OF IRON AND URANIUM.

BY HERMANN SELLE.

Prepare solutions of sulphate of uranium and cyanide of potassium and iron, and at the time of employing the intensifier, mix them together in equal proportions and in such quantity as experience shows to be requisite for one or more days use.

By the mixture of these two liquids sulphate of potassium is formed, and urano-ferrous-cyanide which remains in solution. If we pour some of this liquid upon a fixed negative, the silver deposited upon the latter converts the urano-ferrous-cyanide into cyanide of silver, which forms a brownish deposit on those parts covered with reduced silver.

By means of this liquid we intensify as long as considered advisable (with a stronger solution it takes place instantly) and leave the negative to dry. It becomes still blacker in drying, but after being varnished it resumes all its intensity. The liquid poured off from the negative may be employed again and again so long as it contains urano-ferrous-cyanide. This intensifying appears to be very important for the reproduction of drawings or engravings. No other method gives so much regularity and vigour, while leaving the negative transparent.—*Bulletin Belge de la Photographie.*

◆

CHLORIDE OF IRON AS A SOLVENT OF SILVER.

M. Obernetter, in the *Bulletin Société Chimique,* remarking on the property possessed by chloride of iron of converting finely powdered silver into chloride of silver, and of redissolving this compound after its formation, proposes to employ it in the following ways:—

1. To remove stains of silver from the hands, clothes, &c., it is only necessary to apply the solution to the spot with a brush or pencil, and then to wash it. Chloride of iron is not injurious to the skin, and is preferable to cyanide of potassium, which is so dangerous.

2. To reduce to a proper degree a too black negative plate, pour, after fixing the proof, a greatly diluted solution of chloride of iron on its surface, and, when the desired depth has been produced, wash it well. By this means the most delicate details remain uninjured.

3. To make faint negatives deeper, run a weak solution of chloride of iron over the glass plate; then strengthen with pyrogallic acid and silver mixed.

The operation should be performed in diffused light, in order to facilitate the reduction of the chloride of silver.

This method is especially adapted for obtaining instantaneous proofs.

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* If we remember rightly, M. Gaudin first published his researches in this direction in *La Lumière* in 1860 or 1861. From the statement above it appears he had experimented earlier.—Ed. Photo. News.

HINTS FOR OUT-DOOR PHOTOGRAPHERS.

To Be Read over carefully before taking a Trip from Home.

BY VALENTINE BLANCHARD.[*]

1. Never clean a glass out of doors (*if you can help it*), and therefore take a sufficient stock ready-cleaned with you.

2. In cleaning a glass, remember it has two sides, therefore *don't forget one of them*—for you can ill spare the silver from the bath which is reduced upon the *neglected* side.

3. Carry a small dusting-brush in your waistcoat pocket (unless you can find a better place for it), and don't lend it for love, and certainly not for money.

4. Carry your stock of collodion in several small bottles rather than one large one, for it is decidedly *awkward* to break your only bottle of collodion when working a mile from any habitation and twenty miles from a chemist's shop.

5. Before packing up your apparatus, overhaul each article, and anything found wanting "make a note of," or, better still, hunt it up at once; and particularly take care of nuts, screws, &c., &c., and all such small fry, for the large articles will take care of themselves.

6. Remember that though dust may considerably increase the picturesque effect of some things—an old bust, for instance—its presence is by no means imperative on photographic apparatus · indeed, the *pictures* will be none the worse artistically for its absence altogether.

7. Don't commence packing up until all the articles needful for the journey are collected together, and, in order to make "assurance doubly sure," mentally go through the operations involved in taking a picture, thus:—Begin with the plates, store them carefully, ready cleaned, in their box; then put aside the collodion necessary for the trip; then the bath and dipper; afterwards developer, intensifier, &c., and so on to the end; and be sure you omit no part of the operation, otherwise be not surprised some fine day to find the camera minus the lenses, the bath minus its contents, the camera minus the dark slide, &c., or some such decidedly awkward mishap.

8. Before starting, weigh out several ounces of sulphate of iron, and make them into packets; the bother of scales and weights will thus be removed; for if a twenty-ounce bottle be used as a stock-bottle for developer, the strength will be about right for ordinary work, and the amount of water can easily be varied to meet peculiar requirements. Of course you can easily measure out your acetic acid in your developing measure.

9. Don't be down-hearted at the sight of a cloudy morning—it is frequently a sign of a fine day; and, on the other hand, rarely trust a cloudless sky at nine in the morning; the chances are, ten to one, that it will be dull by two o'clock.

10. A calm day is of course best for foliage if the exposure be long, but remember at such times nature frequently puts on her most insipid look; therefore be not afraid to sacrifice something of the excessive sharpness, in order to obtain a lasting trace of her more varied aspects.

11. Before you pitch your tent, choose well your ground; and, whenever possible, protect yourself from sun and wind, and keep as far from a dusty road as possible.

12. Never trust yellow glass, and, if you have any doubt, use two thicknesses. The nearer the colour approaches ruby the better for your results.

13. Before you prepare your first plate examine well your tent or dark box, and be sure there are no pin-holes of white light anywhere.

14. No matter how affectionately dust may cling to the side of your plate, you must separate them with all the determination of a poor-law officer. It is astounding how dust will cling for support, but don't believe in it, for it won't do.

15. In an under-exposed picture bring out all you can in development, and don't be impatient; for, if you cannot bring out detail, intensification will only make matters worse. As a rule, do not hurry development, and, if needful, apply several lots of developers. In an over-exposed picture, however, stop the development as speedily as possible, and in intensifying apply plenty of silver.

16. Work with the largest stop you can afford to employ, for remember you will never get perfect atmosphere in your pictures by employing a lens with a small stop.

17. Never *fix* your pictures in the tent, but *wash* them well. You need not then be afraid of daylight, for its influence is rather beneficial than otherwise.

18. If you are at all short of water, do not fix your negatives until you get home, for should they partly dry, you will have a stain where the action is stopped, if the fixing operation is imperfectly performed.

19. Remember an artistic picture costs but little more trouble than a worthless one; therefore, use well your eyes before you begin work, for though the camera is a most obedient instrument, *you* must first *see* the picture, for you cannot expect the lens to see it for you.

20. Unless you have an inexhaustible stock of patience, stop at home.

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THE CHEMISTRY OF FLAME.

BY PROFESSOR TILLMAN.[*]

All the phenomena attending the artificial production of light are not yet fully understood. Light is only one of the effects of the burning of hydro-carbons in the gaseous state. The solid candle and the liquid contents of the lamp must be volatilized and brought into the same expanded state as ordinary illuminating gas before they can be burned. This condition is attained, in the case of the candle, by the heat of the flame; the liquid wax or tallow, by capillary attraction, is carried along the wick to the point where it is turned to gas. Yet light does not emanate from gases. Draper found that while gases heated to over 1,100° centigrade do not give light, all the solids subjected began to be luminous at about 510° C, and they display the several colours of the prism, and finally emit a white light.

In the process of burning illuminating gas, the hydrogen is first combined with the oxygen of the air, and the solid particles of carbon, thus deserted by the hydrogen and exposed to the heat generated by the burning gases, become incandescent, and afterwards unite with oxygen, forming carbonic acid gas.

It is, however, true that when the carbon is consumed at the same time with the hydrogen, no light is evolved; such condition exists when the oxygen is mechanically but thoroughly mixed with the hydro-carbon gas before it arrives at the place of burning. This is effected by the Bunsen burner, in which the air is admitted at the bottom and mixed with the gas on its upward passage within the burner.

The result of this simultaneous burning of both carbon and hydrogen is an increased amount of heat and an almost entire absence of light. It seems, therefore, to be essential to the production of light, that the combustion of the carbon should take place after that of the hydrogen.

Incandescence.—Steel filings dropped into a current of heated gases give forth brilliant scintillations. Hare, soon after his invention of the hydro-oxygen blow-pipe, found that a pencil of lime held before it, in the burning gases, emitted a light of intense brilliancy. Such a light, when its rays were thrown into parallel lines by means of a parabolic mirror, has been seen in diffused daylight at a distance of more than one hundred miles. But to assert that light is generated because carbon or any other solid is incandescent, is not to explain the phenomenon.

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[*] From the Year-Book of Photography.

[*] From a Paper entitled "Clydonics," read before the American Photographic Society.

Light is proved, beyond a doubt, to be the result of waves moving transversely to the line of propagation; the solid from which it proceeds must, therefore, have the power of producing such waves in the æth. The interesting question to be settled is, whether the solid itself, or the æth within it, can be set into high vibratory action by means of waves of heat having a lower rate of velocity. Reasoning from analogy, we must decide in the affirmative.

Light from Rapid Dilations.—Only one other cause for æth-undulations by means of carbon can now be suggested; it arises from the characteristics and conditions of the three important simple bodies which play the principal parts during ordinary combustion. Oxygen, the element of which more than one-half of our globe is composed, when isolated, is a permanent gas. No power yet applied has reduced it to the liquid state. Hydrogen, a gas sixteen times lighter than oxygen, has also no cohesive power. Natterrer, of Vienna, subjected these gases separately to a pressure of 3,000 pounds to the square inch, when at a temperatue of 106° centigrade below the freezing point of water, without producing cohesion. Yet these two gases, when mixed in the proportion of two volumes of hydrogen to one of oxygen, are, by the electric spark, instantly condensed to steam, and, on cooling, to water. Carbon, on the other hand, when isolated, is always a solid. No amount of heat yet applied has brought it to a gaseous, or even a liquid state. In its most condensed condition—as the diamond—it had 3·55 times the specific weight of water; it is 41,890 times heavier than an equal bulk of hydrogen, 2,618 times heavier than oxygen, and 2,992 times heavier than olefiant gas ($C_4 H_4$).

In the process of illumination by the combustion of hydro-carbon gases, as described, the isolation of the carbon seems to be essential. It must, therefore, instantly change its volume and become a solid, and then as quickly assume the gaseous state, in the formation of carbonic acid gas. These rapid contractions and expansions of carbon may act as pulsations on the pervading æth, and thus generate the whole series of waves, which, commingling, form white light.

It is passing strange that carbonic acid gas, a resultant in generating light and heat—including the vital heat of myriads of animals—should, after its passage from the lamp or the lung to the leaf, be again separated from oxygen by a force similar to that its constitutents can generate under certain conditions.

SOME NEW FACTS IN RELATION TO THE SUNBEAM.

The boundless extent of physical science is forcibly illustrated in the study of the sunbeam. What could seem more simple at first sight than a ray of light? And yet it would require long study to learn all that has been ascertained in relation to it.

First was Newton's discovery that the white ray might be split into seven brilliant and beautiful colours. Then it was found that the ray was a compound of three elements, light, heat and the actinic rays—those which produce the changes in the photograph, and effect all other chemical actions of the sunbeam. Finally, within these few years has come the great discovery that the light produced by burning different substances is not only different in appearance, but, when spectra are formed by passing these different kinds of light through a triangular prism, the spectrum of each element is crossed by lines peculiar to itself. Consequently, however far light may travel, it bears in its constitution the evidence of its origin, and thus brings to us from the sun and from the stars a knowledge of the substances which are glowing in those distant bodies.

Each of the three elements of the sunbeam, light, heat and the actinic rays, has been subjected to a great number of minute and delicate observations, and many curious facts have been learned in relation to each. Among other things it has been found that some substances which allow light to pass reely through them are almost wholly impervious to heat.

Professor W. A. Miller, the author of the great work on chemistry, which we noticed in a late number, has recently been engaged in ascertaining a similar series of facts in relation to the actinic rays. He finds that the same law applies to these; bodies which possess an equal power of transmitting the luminous rays vary very much in their power of transmitting the chemical rays. This is an important fact in photography, as it is desirable to have the lenses of photographic cameras constructed of substances that will transmit a large proportion of the actinic rays.

Of all the substances examined by Professor Miller none was found to surpass rock crystal in diactinic power. Water, ice, and white fluor-spar rival it, and pure rock-salt approaches it very closely. None of the different varieties of glass transmit rays extending beyond one-fifth or one-sixth the range afforded by quartz. A plate of glass less than 1-100th of an inch in thickness cuts off these rays almost as completely as a plate of twenty times the thickness. The vapour of water transmits the actinic rays freely, although it is extremely impervious to those of heat. Of the liquids examined, water is most diactinic, and next in order to alcohol.—*Scientific American.*

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, August 1st, 1865.

One of Mr. Dallmeyer's new landscape-objectives having fallen in my way, I was desirous of ascertaining its advantages. After having satisfactorily tried it myself, I requested M. Ferrier to make use of it, and to communicate to me the result of his experiments. I have just received from him the following letter, which I am happy to communicate to you, as it emanates from an artist of unquestionable judgment:—

"My dear M. Lacan,—The objective which you gave me to try possesses new and very valuable qualities, and will render great services to photography. The immense space it embraces allows it to almost replace panoramic apparatus; the shortness of its focus permits of its operating rapidly; and the distinctness of the image that it gives leaves nothing to be desired. Its small size renders it much lighter and more portable than those constructed on the old systems, and especially admits of a much less bulky camera. It is, in short, I repeat, an excellent acquisition to photography. Ferrier."

From information which has reached me from Berlin, I see that photolithography holds a very important place in the exhibition at present open in that capital. This application of photography, which, in my opinion, as doubtless in yours, is destined sooner or later to take the place of the processes hitherto employed, is said to be the subject of serious study in Germany. However, I see that the jury has awarded a medal to our fellow-countryman, M. Marie, which leads me to think that his works have been deemed superior to those of the other experimenters, and that the progress that he has effected in practice has not been surpassed even in Germany. In fact, he has attained a beauty of execution which already realizes all that could be hoped for. The method he employs, and which he keeps secret, is no doubt derived from M. Poitevin's, but it has evidently undergone happy modifications. The clichés that M. Marie makes use of are due to our best photographers, and in their transfer to stone they do not appear to lose any of their qualities. Bingham is publishing a collection of views obtained in this manner from the negative of Mr. Ferrier the son. Pierre Pettitt also has just been treating with M. Marie for an important publication, which is to reproduce all sorts of objects figuring in the coming Universal Exhibition of 1867.

Thus transferred to the lithographic plate without losing any of its qualities, photography will find new and important openings. In the first place, it will be definitively applied to the illustration of books. How many attempts in this line have proved fruitless, and have been abandoned on account of the inconveniences attending the ordinary printing with salts of silver, of the inconveniencies of price, and of the want of durability above all. At this moment, even, a charming work is being published, M. Ildéfonse Rousset's "*Etudes Photographiques*." It contains delightful views, landscapes in the style of those which have made the reputation of Vernon Heath, Wilson, Bedford, &c. This work is certainly successful; but how popular it would become if it were composed of unalterable lithographic plates, costing one-fourth of the present price!

Again, the Museum of Natural History possesses a numerous collection of types of the different human races, commenced ten years ago by Louis Rousseau, and continued at present by M. Ph. Potteau. What services this collection would render if, instead of being printed at great cost, and at a small number of copies, it could be printed on stone, and in large editions!

Some manufacturers of bronze articles, of jewelry, and of furniture, supply their travellers with photographic copies of the chief patterns that issue from their workshops. These albums offer immense advantages both to the manufacturer and to the buyer. The cost is, however, high, and commerce is apt to calculate; but how generally it would seize upon this means of facilitating its transactions, if the transfer of these pictures to stone became sufficiently practical to be employed upon a large scale. The success obtained by M. Marie allows us to hope that we are entering upon this new phase of photography.

The French Photographic Society has but one more meeting to hold before the vacation, which commences with the month of August. For many, indeed, the vacation has already begun, and I am made aware of that fact by the scantiness of the documents that I have to transmit to you. But if, for the major part of those who are starting away, this season is one of repose, it is for photographers, on the contrary, a period of labour. Some are gone in all directions in search of new scenes and of new subjects to reproduce; others, portraitists, see their operating-rooms invaded by hosts of strangers, who are either passing through Paris, or sojourning there for a while. Thus it is that these three months are frequently the most fruitful in research and in discovery. Let us hope that it will be so this year, and that I shall have ere long new marvels to rehearse.

Ernest Lacan.

PHOTO-BINOGRAPHY.

Sir,—I referred Mr. Hughes to an "optical fact," in the shape of a life-sized binograph, and as he can only meet this challenge by "an opinion," I agree to close here the subject with him.

"J. C." is confessedly so uninformed upon the subject that I can see nothing in his letter requiring a reply.

Your own remark, however, is to the point, and I at once join issue with you, and pledge myself to prove practically "that binocular relief exists in the binograph as distinctly as we see it in the stereoscope."

I leave to you, in courtesy, the privilege of naming time and place, claiming only for myself the privilege of being judged by scientific men, who shall not be shopkeepers.—I am, sir, yours respectfully,
Edwin Pettitt.

Birmingham, July 26th, 1865.

[Mr. Pettitt does not state the nature of the proof he is prepared to offer. His allusion to "shopkeepers" is an unwise one, as some of the most distinguished names in science are connected with trade. His exception would at once cut out such men as Warren de la Rue, and others. —Ed.]

Dear Sir,—It has occurred to me that whatever effect of relief and modelling is produced by Mr. Pettitt's system of binocular enlargements, which would be much enhanced if *four* lenses, equi-distant, were used instead of two, the blending of four images in one enlargement would add a *vertical* stereoscopic effect to the horizontal one, would produce a softening of the lines in *every direction* equally instead of only *laterally*, diminish the exposure by one half, and, I presume, add much to the general effect of relief. I have not tried this experimentally yet, but will when I have more leisure. Perhaps others might wish to try the experiment. These would, I suppose, be called quartocular photographs, or quartographs.—I remain, yours faithfully,
H. C. H.

153, *Regent Street, July* 31, 1865.

PANTASCOPIC CAMERA.

Sir,—I regret that I am again under the necessity of criticising the incorrect statements of Mr. J. R. Johnson; I regret it all the more, because I am now obliged to allude to the calumnious statements contained in his last. But without further preface I will proceed.

You are told by Mr. Johnson that "X. Z. C., &c., &c., is a very young gentleman lately in the service of the Pantascopic Company." Now, when Mr. Johnson tells you this he tells you more than he *knows* himself. He would indeed have been justified in *thinking*, and perhaps even in *saying*, that the letters of X. Z. C. exhibited ideas and were written in language which so forcibly reminded him of "a very young gentleman, lately in the service of the Pantascopic Company," that he could not but believe that that gentlemen was the writer of them; but when he tells you, confidentially, that X. Z. C. *is* a young gentleman, &c., he tells you, I repeat, more than he *knows* himself.

However, in this instance, sir, he has fortunately, but inconclusively, hit pretty near the truth. I am a "gentleman," or at least so I would humbly hope. I may be "very young," for though I am more than nineteen, I am less than ninety, and I did enter into "the service of the Pantascopic Company."

Mr. Johnson next tells you that while so employed, I *must* have become acquainted with the subject-matter of his specification. This deduction is unsound and unwarranted, and, as I can prove, is incorrect.

Mr. Johnson's specification might have been seen in my hands, although there was not one of *those* occasions on which a single paragraph of the contents was seen by my eyes. I never read half of the first page. Beyond that page I know nothing at all; of that page I remember not a word. I was aware, as Mr. Johnson tells you, that a modification of the mica plate camera was being made for a Mr. Price (a gentleman for whom I have much respect), but I was not aware of that fact until after I had proposed to Mr. Johnson the use of talc plates in a pantascopic camera under the impression that such a use of them had not occurred to him.

The camera which was being made for Mr. Price I now think, and always thought, was bad in theory, and would be found worse in practice. It has no resemblance at all to the one described by myself.

Mr. Johnson imagines that your readers will agree with him that by no possible figure of speech can I call the instrument I have described "my camera."

I will tell you how I came to devise the instrument which, more for the sake of brevity than from egotism, I came to designate as "my camera."

I liked the pantascopic camera, and considered (as intimated in my first letter to your paper) that for *particular* purposes it was "a very valuable instrument." Its price, however (as also intimated in my first letter), was more than I could well afford to pay for a half plate camera. One evening, whilst "going down Holborn Hill," I thought if I could devise any method by which, though at the expense of convenience and appearance, a camera might be made at less expense, perhaps Mr. Johnson would kindly allow one to be constructed for me in accordance with that method. However, after carefully considering everything about the instrument, I failed to see how its price could be reduced—and then only at the expense of most of its beauty—by more than £4. I then thought that a camera made upon Sutton's plan would be cheaper, but the construction of the lens presented to me (though Mr. Johnson has asserted it did not) a difficulty; the construction of curved glass plates, to me and on a small scale, another and insurmountable one. Daguerreotype plates next came to mind (I did not remember to have read of them before, although I now see they have been mentioned in some of the early Journals of this year), but the manipulations of these plates I voted as "a horrid bore," together with the curved glass ones, because of their *inflexibility*. "I must have plates which are flexible," was my next thought, and the word talc was instantly upon my lips. "Bah!" said I, "the thing is so simple, it must surely have been thought of before." I then thought there must be something about talc which would prevent its use, perhaps that the unbending would tear the film. "May be, others have thought so without trying the experiment; at all events I'll try it," were my next words; and accordingly, the next day, I sent Mr. Johnson's boy to Solomon's establishment, where he procured ten quarter size talc plates, upon two of which I experimented, thereby encroaching to the extent of fifteen minutes upon the time which I ought to have devoted to Mr. Johnson's service.

I found no difficulty whatever in using the plates, which, even when varnished, might be rolled into perfect cylinders without the slightest injury to either picture, plate, or varnish. I showed these plates to a friend of mine, a young engineer, who has taken out a patent for a really valuable and novel improvement in the reversing gear of the steam engine. He was highly delighted with them; but endorsed my opinion, that a patent could not be obtained for the use of such plates in a camera, inasmuch as there was no novelty either in the material, its flexible property, or its temporarily curved shape. I then thought I should obtain the esteem of Mr. Johnson if I communicated to him my idea, which accordingly I did. He heard my account with apparent amazement and wonder, which prevented his thanking me for the kindness which prompted me to show him the results and explain my plan. He suddenly exclaimed, however, "I invented it!" or "I thought of it before!" "It's in my specification!" I regret to say, however, that the tone in which he made these statements, and the circumstances under which they were made, together with my usual incredulity, caused me to think they were without foundation. Hence, I never looked in his specification to see if it were true or not, and quite believed it was not so until he quoted from that specification a few weeks ago in the Journal. As to the diagrams, &c., I have never yet, even to this day, seen or read a description of any plan for a curved plate camera, except those produced by myself, on the very spot where I now sit.

At this present moment my fire-place is heaped with the first plans I drew of this camera, together with diagrams drawn to illustrate the views I hold in relation to plane and panoramic perspective. Under these circumstances, sir, I think I am entitled to the credit, poor in quality, and miserably small in quantity, of being able with truth to call the instrument I have described "my camera."

Mr. Johnson says, when speaking of my signature, "I respected this incognito, detesting all personal discussions." I cannot credit either this statement or its qualification, because he has made three attempts to drag me from that incognito, and has from the first permitted personalities to creep into his letters.

In conclusion, I would feel obliged if Mr. Johnson, when he next attacks "Architecton," would do so in phraseology which is less likely to convey the notion that the attack was intended for me.

Since the conduct of Mr. Johnson obliges me to abandon the signature "X. Z. C." I must subscribe myself, your obedient servant, D. Winstanley, Jun.

Collyhurst-road, Manchester, July 29th.

[We have felt it necessary materially to condense Mr. Winstanley's letter, as it already occupies more space than our readers, we fear, will think justifiable on a matter chiefly of a personal character. Regarding the use of mica or other flexible plates for panoramic negatives, there is nothing whatever new or patentable in the idea. When Mr. Sutton devised his panoramic camera half a dozen years ago, one of the first thoughts was to use mica plates. We had many conversations with him on the subject, in which we discussed the possibilities in regard to the use of mica, gelatine paper, &c., for negatives. Attempts were made to get plates of mica, and, if we remember rightly, Mr. Squire did supply a few, but insuperable difficulties were found in obtaining plates sufficiently large and sufficiently perfect. This fact we intimated at the commencement of the present correspondence.—Ed.]

Sir,—Having read the correspondence between Mr. Johnson and the late operator of the Pantascopic Company, and having carefully thought over his diagrams, it strikes me we are no nearer the solution of how to make a cheap pantascopic camera than we were before X. Z. C., &c., adorned your columns with his wanderings in dream-land.

I find in Messrs. Johnson and Harrison's patent exactly what X. Z. C., &c., claims as his novelity, and I think it's a pity he should try to deceive your readers by hashing up and twisting other people's inventions so that they may appear new. I was in hopes we were going to be shewn how to make a *cheap* pantascopic camera, and as I want one to take larger views than 12 by 7 (which I think is the largest size the Pantascopic Company make), I was all impatience to know how so desirable a camera was to be made; imagine, then, my surprise when I find mica plates of large size connot be obtained, and the "beautiful contrivance of the magnetised pulley" and "mecurial fly" is impracticable, and, even were it practicable, it would be exceedingly expensive (at least, so my brother, who is a chronometer examiner, says). X. Z. C., &c., has succeeded admirably in telling us how to make a very dear revolving camera, if, indeed, it would revolve at all.

It seems to me that after waiting all this time and trying to find out how X. Z. C.'s mercurial magnetic pantascopic camera is to work, that the way to make a cheap revolving camera has not been his motive, but rather to find fault with the pantascopic camera as sold at Red Lion Square. By carefully selecting the proper subjects, there is no unpleasant distortion in pictures produced by a revolving camera. Perhaps X. Z. C., if he *has* a camera, has been trying some interiors, or has taken a view of a house with walls on each side, or perhaps put his camera in front of the Manchester Infirmary. It is so easy to find fault with anything we blunder over. I want to buy a revolving camera to do 20 by 10 plates, and if X. Z. C. can tell me how to make a cheap, simple, and light instrument, I shall be grateful; but pray let him be practical, and not try to palm off old patented ideas and expensive mechanical monstrosities which only mislead and confuse those who, like your humble servant, want a cheap and simple pantascopic camera.—I am, sir, your obedient servant, Edgar James Clarke.

City Road, N.W.

Photographic Notes and Queries.

Non-Explosive Gunpowder.

Sir,—I have also worked in this direction, and easily accomplished it.

Shaking the powder up with lime is very efficacious, in the proportion of 1 of powder to 1½ or 2 of lime, plaster of Paris, powdered clay, black oxide of manganese, &c. A red-hot iron only produces a few scintillations while in contact. I prefer a white powder to a black one, because a mistake can never occur in taking the unprotected for the protected; but it has this objection, that it allows the fact to be obvious that the sieve or other means for separating a fine powder from a coarse one does not separate them completely, which gives the gunpowder a grey colour, but the quantity is so small as to scarcely show itself by weight. It has, nevertheless, the effect of making the powder slow of ignition. This might be an advantage in some cases. If we wash the material so as to remove the impalpable dust, which is the part that adheres so pertinaciously to the gunpowder grains, we greatly reduce its preservative powers. Fine washed emery powder permits the gunpowder to explode, although mixed in the proportion of two to one, while lime prevents any explosion, and, when separated by the sieve, allows the powder to explode as freely apparently as before. If a black substance be used instead of white, as lime, the slight adhesion I have alluded to is not visible.

If Mr. Gale has succeeded in discovering a substance that does not in the least adhere to the gunpowder or effect its usual properties, he will be a public benefactor, but black is the worst colour a preservative substance could have.—I remain, yours truly, T. S. Reeves.

17, *Bedford Street, Plymouth,*
July 22nd, 1865.

[Our columns are usually devoted rather to the arts of peace than those of destruction, but as this topic has recently been under public attention, it will interest our readers to know what an old photographer and correspondent of this Journal has done in this matter.—Ed.]

Preparation of Oxygen Gas.

Sir,—In your last there is an account of and reference to accidents by using chlorate of potash mixed with binoxide of manganese. Now, as it is well known that chlorate of potash is an explosive article, when heated, why use it at all?

In the Covent Garden Theatre, in using the lime-light, they use only the manganese, and make a great deal of oxygen gas from it. It is put in iron retorts and made red hot, when the gas is generated very fast.

If you think this worth a place in your valuable Journal, you are at liberty to insert it.—Yours truly, J. S. P.

[The oxygen obtained from the decomposition of peroxide o manganese is not so pure as that from chlorate of potash, which is also a much more plentiful source of the gas.—Ed.]

A Silver Stain on the Nose.

Sir,—I cordially sympathize with the writer of a letter that was copied into the pages of your Journal some time ago, having, as the wife of a photographer, full experience of irregular meals, blackened linen, and all the other "ills that (photographic) flesh is heir to;" but it is a personal matter that I beg leave to consult you about.

Last night my husband, being much interested in "a new process" of quick drying while sensitizing his paper, I proffered my services to hold the sheets. The evening wore on—I got sleepy—and, I suppose, must have been rubbing my eyes; for this morning I discovered the end of my nose black, and a corresponding mark on one cheek! I don't mind my fingers being stained—my hands are used to work, and people know what it is—but a black nose!! Well, I don't approve of anybody complaining of a husband; but I do think he need not have been the first to laugh, and then tell me that "it would wear off."

He offered me cyanide of something; but told me it was a poison, and that he had never tried it; so I thought of writing to you, to ask if you could tell me what will take off this colour? I was in the studio to-day, sitting, while he tried a new developer. I need not say what the picture was like, but I'll take care of that negative.—Hoping you will excuse this, I am, Sir, your obedient servant, Sybil.

[We sympathize with "Sybil." It was too bad of her husband to laugh at the black nose obtained in his service. Probably he thought the nose a pretty one, and did not object to the black spot which directed especial attention to it; or, possibly, in his eyes it had only the effect of a patch, such as the belles of a few generations ago used to apply to the face to enhance, by contrast, the beauty of the complexion. It will doubless "wear off," but since it is probable our fair correspondent would not like to present herself at church with it, and risk disturbing the devotions of others by attracting attention to her nose, we must assist her to remove it at once. Avoid the cyanide, however: it is dangerous and unnecessary. On another page of the present number "Sybil" will find a short article on chloride of iron, where she will find that this agent will remove silver stains without injuring the skin. Should it not be at hand, make a little tincture of iodine, by dissolving six or eight grains in an ounce of alcohol; apply this to the stain with a camel's-hair pencil. This will turn it yellow; a strong solution of hyposulphite of soda will then remove the stain altogether; and, after rinsing with water, the nose will be uninjured, and "Sybil" will have regained her pristine loveliness.—Ed.]

Artificial Light.

Sir,—As the magnesium light has of late been the subject of great interest to the photographic world, will you allow me to make a few remarks on an artificial light? I am quite an amateur photographer, my knowledge of the art being confined to the production of positive pictures on glass. I have, however, been making a few experiments in taking photographs at night by means of a light quite artificial. Neither magnesium wire nor the metal itself is in any way mixed with or introduced into the compound. It is a light which is quite equal to, and in fact surpasses, that substance in its luminous properties, besides lasting longer in duration and being much less expensive.

I forward you a specimen of a photograph, taken about half past nine on an evening late in April, with a very commonplace lens.—I remain, sir, yours, &c., Jas. Wilkinson.

1, *Bretten Terrace, Chelsea, 31st July*, 1865.

[We shall be glad to hear more of the light employed. No photograph was enclosed in your letter.—Ed.]

Miscellaneous.

Novel Application of Photography.—Among the numerous useful applications of which photography is capable, there is one both novel and amusing which deserves to be recorded. Urgent private affairs detaining a certain prince at Palermo, he could not, as usual, pay his annual visit to Paris this summer. But the prince's wardrobe required replenishing, and with a new Neapolitan dynasty came new fashions; the prince was in a state of sartorial despair, till the happy thought occurred to him to be photographed, on the scale of one inch to the foot, and to send the proof to an eminent Parisian *tailleur*. The artist took his measures accordingly; the suit was duly made and forwarded to Palermo. The prince, on receipt of his garments, sent a letter to the tailor, in which he proclaims the fit to be admirable. He is delighted, and so is the tailor. The prince sent another photograph representing him in his new suit. It is easy to see that it is a perfect fit.

Treatment of Gold and Silver Sulphurets.—At Freiburg, in Germany, gold and silver sulphurets are treated by Professor Plattner, as follows:—"The sulphurets, after an impalpable pulverization, he subjects to a careful roasting. The roasted ore is then placed in a vat with its bottom perforated for allowing chlorine gas to impregnate the ores, and the gas to be retained in the covered vat for a certain time, say from twelve to twenty hours. The vat is then uncovered, and water is poured over the entire mass of ore; all the metal atoms which are held in the chlorine will pass off as chlorides, and may be collected by troughs leading from the bottom of the vat into receptacles, and the various metals precipitated.

The New Substitute for Gutta-Percha.—Some time last year, at a distribution of first-class prizes by the Prince of Wales, one was awarded to Sir W. Holmes, for having brought before the mercantile world and into prominent notice the "substitute" in question, which is the juice of the *Sapota mulleri*, or Bullet Tree, long known to the inhabitants of the Essequibo and other rivers of British Guinea as ballata. This gum, it is considered, will supply a great want of the day, and prove a good medium for telegraphic and other purposes; it is also, when fresh, the best waterproofing material known. It is amazingly ductile on immersion in boiling water, and can be easily moulded into any form or shape. It has also another recommendation—its smell is far from unpleasant, being very similar to that of musk.

Talk in the Studio.

Photographic Piracy.—In reference to the charge of piracy, referred to in our last, as preferred by Messrs. Burton and Sons, of Leicester, against Messrs. J. and T. Spencer, of the same city, the latter gentlemen send us the following explanation:—"Several election caricatures, of which the enclosed sketch is a photograph copy of one, were published by us during the election in this borough. As it was thought desirable to identify the respective parties on the poll, it was suggested that portraits should be used. To effect this the heads alone of the candidates were cut out of cartes de visite, and stuck on the caricature, thus identifying each candidate. These cartes, the production of Messrs. Burton and Sons, *were not copied and sold as cartes de visite*, nor were their pictures copied as a whole, as stated by them, the heads only in each case being used. And as Messrs. B. have on former occasions been indebted to us for many scarce and valuable engravings which they have copied, we should have thought that a little matter like this, especially for a harmless electioneering squib, might have passed without comment. Thus it will be seen that Messrs. Burton have not only greatly exaggerated the affair, but have made wilful misstatements, as they did not publish the election photographs at all, the whole series being designed and produced by us, except so far as admitted above. They appear to make much ado about nothing, but they should remember that those who live in or by glass houses should not throw stones.—Jno. and Thos. Spencer." This explanation puts a different complexion on the matter, and it is a pity it was not made in the letter from which we made an extract last week, in which Messrs. Spencer merely state that they copied without scruple, because they were not legally debarred from doing so, and alleged that the practice was common, which, if true, would not make it the less dishonourable. In reference to the facts, however, it appears to us that to make use of the head of a photograph to join to another body in a harmless squib is quite a different thing to copying a picture for sale; and if this be the "head and front " of the offending, it would have been better if Messrs. Burton had passed the matter without complaint.

A Cheap and Efficient Mode of Cleaning Varnished Plates.—A correspondent thinks the following may be useful to his brethren :—"Take about two ounces of common washing soda, and add it to one pint of water; put into a dish, and, as soon as the soda is dissolved, put in as many plates as the liquor will cover; let them remain all night. Next morning the varnish and film may then be taken off in one piece, without any more trouble than just wiping the finger over it. I have used it for eight years, and never had the least difficulty in removing the varnish or films that had not been varnished."

Polyform Portraits.—Mr. S. Glen Payne has forwarded us some further specimens of polyform portraiture, which are very clever. In one group with five figures the same gentleman appears three times, each time differently employed and placed; the same lady appears twice, once reading a letter, and again as a looker-on. The grouping is good, and there is no trace of joining. A comic sketch, entitled "Election Time," or "I'm not myself at all," represents a laughing gentleman wheeling himself in a very drunken state in a wheel-barrow. This is also capitally managed.

Substitute for Ground Glass.—A correspondent at Graham's Town, Cape of Good Hope, sends us as a recipe for producing a substitute for ground glass, consisting of gum mastic, two drachms, dissolved in spirits of wine, one ounce, poured on the plate like collodion, and suffered to dry. Starch applied to glass forms an excellent substitute for ground glass.

Photographs of Criminals.—It is stated that not less than 5,000 photographs of Booth, the assassin, have been sold by one firm in London. The *Dundee Advertiser* says:—"We are informed that interdicts have been served on two persons in Dundee against the sale of photographs of the family of Dr. Pritchard, on the ground that such sale is unauthorized and injurious to the feelings of the friends of the family.

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To Correspondents.

G. F. T.—Apply tincture of iodine, and when the stain has become yellow, treat it with strong hyposulphite of soda, which will remove it. Then rinse thoroughly. 2. Solution of nitrate of silver is poisonous, and would rapidly have a caustic action on all portions of the mouth, throat, and mucous membrane generally, wherever it came into contact with them. The best antidote is common salt, which would convert the nitrate into chloride, which should then be removed from the stomach by vomiting. Label all your bottles, and do not leave them in the way of ignorant persons likely to interfere with them.

A. Ridgway.—We do not know of any method whereby paper coated with collodion, and stuck fast to a negative, from being pressed into contact before it was quite dry, can be safely removed. The best plan will be to moisten the paper, and try to remove it in that way. We have repeatedly cautioned our readers as to the importance of ascertaining, in collodion printing, that the film is perfectly dry, as a very slight trace of ether and alcohol remaining in the film will soften the varnish of the negative, and, with the pressure in the printing-frame, cause the paper to stick, to the great danger of the negative.

A Photomaniac.—The only conclusion at which we can arrive is that the dilute acid is so dilute that it scarcely contains any trace of the acid, and that what is really wanted is a very much larger proportion of it, or a little of a stronger acid. Try that, and let us know the result.

B. F.—A 40-grain bath is unnecessarily strong for hot weather. During summer, a 30-grain bath will be found strong enough. In winter the 40-grain strength is useful.

T. Revon (Haute Saone).—Both the new lenses you name are constructed to embrace a wider angle than the triple lenses, and to define well to the edges of the plates. We are unable at present to give any comparative estimate of the value of the two lenses; but we have seen good pictures by both. 2. In printing stereoscopic transparencies on glass, the method of working depends upon whether wet collodion or dry plates be preferred. If dry plates be preferred, then it is best to cut the negative with a diamond, and transpose the two halves so that they shall preserve the proper relation in the print. It is convenient to attach the two halves to another piece of glass if a large number of prints be required. The tannin process is perhaps the simplest which can be used, and will give very excellent results. The character of the tone is regulated very much by the acid used in the developer. If acetic acid be used, the prints will be of a brown tone; if citric acid, they will be of a blue tone; and varieties may be produced by mixing the two acids. In all cases commence the development by employing the least possible amount of silver in the developer. Camera printing is only suitable for wet collodion. In this method the two sides of the negatives are transposed to the proper position in the process of printing in the camera, and if the negatives are of a slightly larger size than is necessary for the stereoscope, they can of course be reduced easily. All that is necessary is to have a box about twice as long as the equivalent focus of the lenses employed. One end of this has a groove for the negative, into the other that portion of the camera may be fitted which holds the dark slide. Midway a frame containing the lenses is placed, and if they be so arranged as to permit a lateral arrangement, no trouble will be experienced in getting the right result. It is possible to secure a warm purple tone by employing a large amount of acetic acid in the developer, and giving a full exposure. Or the prints may be toned with gold, or with sulphide of ammonium or potassium, or with bichloride of mercury, followed by dilute hyposulphite of soda. Should these details be insufficient, let us know.

Major Tennant (Akyat).—Thanks for the interesting photographs enclosed. The best remedy for the spot of light which appears in some circumstances when compound lenses are used with a small central stop, is to employ a stop in front of the front lens, as well as a central stop, as described in our article on stops in last volume and last Year-Book. The stop in front for this purpose may be moderately large; you will generally find it an efficient remedy. Thanks for your suggestions on strength of bath and temperature. We are fully aware of the importance of a copious index for reference, and we quite agree with you as to the value of having a means of reference to the various subjects treated in many articles, to which their titles afford but little clue; but there are commercial difficulties in the way. The question of reprinting series of articles on certain given subjects has occupied our attention, and may possibly be done at a suitable time. Regarding collodio-chloride, it is, we believe, now sold in two solutions, as you suggest.

R. L. Beard.—We do not know of an operator. We have handed your letter to our advertising manager, who will communicate with you.

J. Smith.—Thanks for your communication.

I. H. S.—We have occasionally met with something like the defects you describe, but are uncertain of the cause. The fact that it is generally on one side of the plate more than the other suggests that the thickness or dryness of the film may have something to do with it. Do you, with the sample of collodion in which it occurs, allow the film to dry sufficiently before immersion in the bath? We do not think the use of methylated spirit does any harm.

M. D. E.—The prints are under-exposed and hard. The use of too much top light produces the black shadows under the eyes of which you complain. Your manipulation generally would be improved by a little more care and precision.

B. R.—Your plan for obtaining a black tone simply secures a little sulphur toning. The acid decomposes a portion of the hyposulphite, and liberates sulphur. 2. Dextrine may be used for mounting photographs. Professional mounters generally use glue. 3. We do not like any kind of ornamental borders round card pictures.

E. M. G.—Any approximation to clouds painted on the sky of a negative should be done on the opposite side, which will prevent the forms being too sharp and definite.

Cameo.—The specimens enclosed are undoubted infringements of the registered designs of Messrs. Window and Bridge and Mr. Palmer respectively. You may print the four or the five without punching into relief, but if the design be used in conjunction with the relief it becomes an infringement.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Francis S. Lowther, Savilie Street, fl
Photograph of J. Clay, Esq., M.P.
J. Russell and Sons, East Street, Chichester,
Three Photographs—Groups of Noblemen and Gentlemen.
Paston and Poole, Penzance, Cornwall,
Four Photographs of Prince and Princess of Wales and Suite at the Botallack Mines.
Mr. Samuel Proute Newcombe, 174, Regent Street,
Three Photographs Rev. John Kennedy.
Mr John Davis Waymouth, Nailsea Bristol,
Photograph of Tomb in Memory of Miss Minnie Bayley, Christchurch, Nailsea.
Mr. John Beattie, Strathearn House, Clifton,
Two Photographs of Mrs. Williams, a distinguished Amateur Actress.
Mr. F. Downer, Watford, Herts,
Two Photographs (Cartes) of Miss Raynham, the Actress.
Two Photographs—Groups of Misses Raynham and Foote, Actresses.
Mr. Alfred Balding, Wisbech,
Photograph of W. Hutchinson, Ex-Mayor of Wisbech
Baown and Wheeler, Wilton House, West Cowes,
Photograph of West Cowes, from a Painting.
Mr. F. Lockey, Bath.
Two Photographs of Rev. A. Headley.

THE PHOTOGRAPHIC NEWS.

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DATING COLLODION.

In the early days of the collodion process, before bromides were universally employed, and when alkaline iodides were those chiefly in use, it was the general custom of manufacturers to send out collodion in two solutions, the plain collodion and the iodizer, with instructions for their mixture in given proportions. These the photographer mixed a few hours, or a day or two at most, before the collodion was required for use, the most sensitive condition being secured within a day or two after mixing, and the maximum of all good qualities in a week at furthest. After that the collodion began rapidly to grow insensitive, and to yield hard, unsatisfactory pictures with any amount of exposure. Since the value of bromides in giving sensitiveness, cleanliness, and keeping qualities to collodion has acquired general recognition, manufacturers have found it safe to send out the collodion mixed ready for use, and where a cadmium iodizer is employed, either wholly or in part, it is found that, within given limits, the collodion will improve rather than deteriorate with keeping. It is undoubtedly an advantage every way to be able to send out the collodion iodized ready for use, for besides the trouble of employing two bottles for one pound or less of collodion, and the necessity of using a third bottle to mix it in, there was the perpetual risk of careless operators mixing in the wrong proportion, and thus securing trouble for themselves and anathemas for the manufacturer. The collodion being sent out ready mixed, sweeps away at once these and many other minor troubles.

But the plan at present in general use is not without some drawbacks. When the photographer does not iodize his own collodion, he has no knowledge whatever of its age, nor of the legitimate influence which age may have had on its condition. If he purchase a stock with a view to its improvement by keeping, he has no means of knowing that it has not already been kept a year or two before it came into his hands. Of the age of the stock in his own hands he has no knowledge, unless he has kept a memorandum of the matter. A gentleman remarked to us, the other day, that when a fresh stock of collodion came in, he always felt it necessary to superintend its stowage, otherwise he would find the new bottles placed in front of the shelf covering up the few old ones, and this being done from time to time, some samples might stand over for years unused. A manufacturer, when informed recently that a sample of his collodion had dissolved when the varnish was applied, remarked that it must have been a bottle which had become decomposed by age, as the collodion, when not decomposed by long keeping, was of the opposite tendency to that which dissolved on varnishing. To this it was answered that it was a new bottle obtained from an agent a few days before. Unfortunately this did not prove it to be new collodion, for sometimes agents, in stowing a new stock, covered up the old, and this might be a bottle which had been made for some years.

It is clear that these possibilities of trouble from collodion of an unknown age require a remedy, and it fortunately happens that a very easy one presents itself. It is simply necessary that manufacturers should date their collodion. The task would not be a very serious one. The labels might have the year printed on safely, and have a blank left for the month, which might be filled in at the time of labelling; or, in the case of very large manufacturers, the labels might be printed for each lot that was bottled. The month and year would be quite sufficient, and the information would be most valuable to the photographer. No loss need be apprehended from stock bearing an old date, for that could always be mixed off with new samples to the advantage of the latter. Some extensive consumers of collodion, we know, find it desirable, on getting in a new stock, to date it for themselves; but as one of them observed to us, "The misfortune is, I don't know the age of the collodion when I get it." This is a misfortune easily obviated, and the trouble will, we think, be well repaid to the manufacturer by giving his collodion the chance of being used at its best age, whilst it will be a boon to the photographer. Vintners preserve carefully the dates of their vintages. Why should not the age of collodion be as important as that of wine? We commend the subject to the attention of manufacturers.

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METHODS OF COLOURING PHOTOGRAPHS.

Dr. Jacobsen's Aniline Colours.

A correspondence recently appeared in our pages on the permanence of aniline colours, in which various arguments and facts were urged on both sides of the question, the preponderance of evidence being, we think, in favour of a fair amount of permanence with these colours. Mr. Werge, whose communication on the subject we published, showed us a number of prints which had been coloured with aniline colours some years ago, and exposed more or less to light ever since. Those which had been exposed to ordinary diffused light had undergone no apparent change; but those which had been placed in a shop window, and exposed to the full blaze of sunshine for years, had undoubtedly faded. Very little argument to the detriment of the colours can be derived from this: a print coloured in ordinary water colours would have suffered in like manner. There are very few pigments which will stand the continued action of sunshine without change, and no person who valued a work of art would ever dream of subjecting it to such an ordeal. So far as we can judge from past experience and a knowledge of the nature of the pigments, we are disposed to think that aniline colours, when treated with fairness, will be found tolerably permanent, on the average not less so than water colours generally, and that for photographs for the album and portfolio they will be found especially suitable. Experimental pictures tinted some years ago with aniline colours—we used then Judson's dyes, and Mr. Sutton's colours prepared by Bailey and Son—have remained without change at all.

One of the difficulties attending the earlier applications of aniline colours to the tinting of photographs arose from the circumstance that alcohol being the solvent employed for the colours, the moment they were diluted to any extent with water, in order to secure delicate washes, the colour was precipitated, not being soluble in water. Another difficulty arose from the limited number of tints which were to be obtained, and the difficulty of obtaining with the limited range of colours provided anything like the necessary variety of effect desirable in successful colouring. The difficulties are obviated in the series of colours prepared by Dr. Jacobsen for tinting photographs.

The series before us, supplied by the English agent, Mr. Trübner, of St. Dunstan's-hill, consists of twelve tints, all of which are freely miscible in water. The colours are: red No. 1, which resembles crimson lake in ordinary water colours; red No. 2, which resembles a mixture of vermilion and carmine; and red No. 3, which is very like carmine; blue No. 1, resembling French blue; and blue No. 2, resembling Prussian blue; bright green, bright yellow, orange, a very rich violet, two browns (one resembling raw sienna and the other burnt sienna), and a colour called neutral tint, very nearly resembling sepia. With the exception of the last, all the colours are perfectly transparent, not covering or hiding the drawing or light and shade in the least. The neutral tint has more body, and does cover to some extent if used in a heavy wash. All the colours have exceeding brilliancy and purity of tint.

In use we found these colours exceedingly satisfactory and easy to manage, washing with the greatest evenness. A firm elastic sable, somewhat short-haired, we found work best. For flesh we found red No. 2, used in a very dilute wash, produce a very excellent effect. It is important to remember that it is almost impossible to commence with too light a wash, and for this very noteworthy reason—whilst it is possible to work over and over without any risk of moving the colour already on the print, it is not possible to remove or lighten the colour already applied. The albumen acts as a mordaunt, and the colour enters into chemical combination with the surface of the picture, becoming at once insoluble and impossible to be removed. It is, therefore, desirable, especially in the flesh tints, to begin with an extremely dilute wash of the colour. Red No. 2, either alone or in conjunction with a little yellow, may be applied in a very thin wash rapidly all over the face, remembering that if the colour be allowed to stand in a wave or pool on any spot, the colour will become deeper at that spot from a greater proportion of it being able to combine with the albumen. A little of a deeper wash of No. 2, or of red No. 3, may then be worked into the cheek, lips, &c., taking care not to use a full brush. Greys of varying tone may be easily mixed by employing the blue No. 1, the green, yellow, and red No. 2, suitable for the flesh shadows of different complexions, and stippled, with a somewhat dry pencil, into the sockets of the eyes, the corners of the retiring shadows on the cheeks and forehead, and the other rounded portions of the face. The two browns and the neutral tint will serve for most colours of hair, but it may in many photographs be desirable to supplement these by a little of a suitable tint or ordinary water colours. With a little skill a wonderful effect of brilliancy, delicacy, and transparency of complexion may be rendered with these colours, which is extremely pleasing, and will probably be very popular with the public.

For draperies nothing can exceed the beauty of the effects to be produced. All the texture of different fabrics, so faithfully rendered by photography, is preserved intact, with the addition of extremely brilliant colour of such perfect transparency, that it appears merely to dye the fabric without in the slightest affecting or modifying fold or texture. For silk draperies the effect is wonderfully striking. Where, either in these or in other fabrics, it is desirable, from some defect in the photograph, or from a wish to modify the effect, ordinary water colours or body colours may be judiciously used in conjunction with these; but with certain important cautions. As a rule, it is not well to mix these with mineral colours, although they may be mixed with some without detriment. They should not be mixed with white lead, but they may be mixed with baryta white, which is permanent and innocuous.

There is one precaution of great importance with these colours; it is, never to touch the print in any part with a colour not intended for it, nor, in washing, to allow the tint to extend the slightest over its legitimate boundaries, as the moment it comes into contact with the albumen it becomes permanently fixed, and cannot be removed; and nothing gives a print such a patchy or imperfect effect as a little colour extending beyond the part to which it belongs.

It should be remembered that here, as in all cases where transparent colours are employed, a perfect and well-defined photograph is required. It is desirable that the print should not be too deep, but it must possess sufficient half-tone to give modelling and proper drawing to all parts; and the tone should be warm rather than black and heavy. If the photograph be wanting in roundness or detail, it may, after colouring with these colours, have additional roundness given to it by a skilled colourist by carefully stippling in delicate shadows, either with these tints or ordinary water colours. A print the surface of which is rough or abraded will yield a patchy, unsatisfactory effect. A good effect is sometimes obtained by stippling in greys to the flesh before the latter is quite dry, and to aid this the flesh may have a trace of glycerine added to retard its drying.

For transparencies for the magic lantern, nothing can exceed the suitability of these colours. To those taken on albumen or collodio-albumen plates, the colours may be applied without any preparation; to those on collodion only they might be applied at once, but if a dilute coating of albumen be first applied and suffered to dry, the colours will combine with the surface, and work in the way we have just described for albumenized paper, giving a brilliant and transparent effect.

The greater amount of artistic skill the colourist possesses the more effective and perfect his results will be with these colours; nevertheless, it is quite easy for persons having a little taste and judgment, with very little technical or manipulative skill in painting, to produce very pleasing tinted photographs by the means here placed at their disposal.

We subjoin a few extracts from Dr. Jacobsen's instructions and remarks, from which some additional hints may be gleaned:—

> The aniline colours have, unlike other pigments, the remarkable quality of uniting themselves chemically with animal matter (wool, silk, albumen), and of fixing permanently on them, in which combinations they appear in the most beautiful brilliancy, and are more proof against light than they would otherwise be, and it is really a lucky chance that the albumen of the photographic print is just one of the materials most eminently apt to combine with the aniline water colours.
>
> From this it results that, the albumen photograph once coloured, the aniline colours cannot be removed by washing. It follows, therefore, for their adoption as a general rule, that to procure light tints, the aniline colours must be laid on in very pale washes, the outlines being well attended to, and should deeper tints be required, they must be procured by repeated pale washes.
>
> The fixing quality of the aniline colours on the albumen is most peculiar to red I., II., yellow, orange, light brown and violet; the other colours may be wholly or to the greatest part removed by repeated washings with pure water.
>
> The fixing qualities of the aniline pigments may, properly taken to account, produce the most charming effects, for a new wash of another colour may be laid on without apprehension lest the first wash underneath might be destroyed. For in-

stance, green, alone rather dull, receives, when laid on yellow, a brilliancy hitherto unknown.

My aniline colours fix directly on the albumenized photograph, and only where it has been too long printed, too much satinized, or touched with the bare finger, is there any difficulty; it must then be rubbed slightly with glycerine, but not too hard, else the fibres of the paper become spungy, and the print itself appears, after the colouring, spotted and unequal. The single fibres attract the aniline colours, and appear thereby darker than the surrounding parts of the print.

For that reason the choice of a good albumenized paper is of consequence. Paper which, treated in the photographic bath, appears woolly and rough, or the fibres of which are too long, will, when coloured with aniline colours, always appear spotted.

Glycerine serves, like poppy-oil in oil-painting, to hinder the too hastily drying of the aniline colours.

For flesh tints, lips, and cheeks, may be used red I. in very pale washes; for brown-red shadows, red II.; for colouring greater parts with flesh tints, red III.; for yellow flesh tints in lighter parts, orange is very useful. The deeper shadows in the photograph are lighted by light brown I., and especially by the latter colour the too much blue or brown tone of the print may be altered to a more sober and neutral one.

Light brown I. affords a fine tint for fair hair and fur; neutral brown may supplant indian ink, and, mixed up with blue and red III., may be usefully employed for stippling up the spots in a photographic print.

It must be understood, that of course not all photographs are suitable to be coloured—for instance, very dark ones—and it should be remembered that bad photographs do not appear better when coloured with aniline colours; on the contrary, these new pigments, being transparent and covering nothing, show all faults of the print the more strikingly.

The general tone of the print, too, is not indifferent nor without influence on the total effect of the coloured photograph; therefore the positive print must be toned neither too blue nor too red.

When colouring photographs on common paper, lithographs, &c., and painting with aniline water colours, the paper must be prepared by laying a cover of not too weak gelatine water over it, so that the colours might stand and appear in their greatest lustre.

As to the power of resistance of the aniline colours to the effects of sunlight, they are by no means inferior to the common animal and plant colours now used in water colour paintings; on the contrary, several aniline colours excel them in a high degree,—f. i. the red of cochenille suffers much more from sunlight than aniline red.

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PHOTOGRAPHY, ARTISTS, AND FINE ART.

In Mr. Sutton's capital novel, "The Photographers," now publishing in the *Photographic Notes*, we have in a recent chapter some pertinent conversations amongst artists on the position of photography as a fine art, and also on its value as a handmaid to art, in abbreviating the labour of artists in working from nature. It is always to be borne in mind that where an author possesses the dramatic faculty in a high degree, as Mr. Sutton's novel proves beyond a doubt that he does, he is not in any degree necessarily to be identified with the sentiments or opinions of the characters he creates, and any comments we may pass upon them are rather as abstract views than as expressions of individual opinion. We may, nevertheless, remark that there is so much of heartiness in *Robinson's* defence of the art claims of photography that it is scarcely unfair, and certainly not unnatural, to suppose that some modification has taken place in the author's own views on the subject, and that he coincides with the views which *Robinson* so well expresses.

A *conversazione* is held at an artist's house, where many of his professional friends are present. A portfolio of photographic life-studies becomes the subject of conversation amongst some artists, from which we make the following extracts:—

"Now, look at these things," said one of them to his companions. "People call them studies for artists; and photographers absurdly suppose they are of use to us. But what use, I ask, could you or I make of such things? Are we to take up a picture from one or more of them, and give it a fine classical name? Or what? The fellows can't suppose that we should give up drawing from the life to copy from such things as these instead? They can't be such inconceivable blockheads as that. What *do* they suppose can be the use to us of a photographic life-study? Is it a help to you in carrying out a work which you have already conceived in your own mind, or as training for your hand and eye in the mechanical part of your profession? In either case I affirm that ready-made studies of this sort can be of no use to you whatever. And the same remark applies to the bits of detail of landscape which they try to palm off upon us at sixpence a print. No. Let an artist learn photography himself, and use it himself as he may require, and I grant you he may sometimes find it handy in abridging his labour; but to suppose that he can ever derive assistance from such ready-made studies as these is absurd."

"But they *don't* suppose anything of the sort," replied another. "Those photographic life-studies are got up in quantities for quite a different class of customers from artists; and they have an immense sale. Everyone knows what photo-studies from nature are, and for whom they are intended. The fellows who do them make a scapegoat of *us;* but people know well enough that *we* don't buy them, and who the kind of people are who do."

"Still," said a third, "these things are very beautiful, and that is enough for me. I don't care by what process they were done, or how. I, as an artist even, would gladly purchase the whole set, if I could. The man who did these had taste, and was something more than a mere mechanic. You get a clue to his order of mind from these photographs, for there is a sentiment and expression in them. When photography is taken up by a man like this, and employed with taste and judgment, it *is* entitled to rank as a fine art, because the manipulator puts mind into his work."

"What's all this about?" said Fano, joining them. "Photography a fine art; and photographers putting mind into their work! Humbug. Let them put their mind into something else, if they've got any mind to put. I never knew a real artist yet who could content himself with this mechanical drudgery. Knock their hat over their eyes, and let us hear no more about 'em."

"But I thought you tried it once yourself, Fano? Photo-sculpture, I think they call it."

"Pazzie. Humbuggino! A miserable, contemptible, *little* humbug; the very worst of all. I could show you the first and last attempt I made at it somewhere about the house; and it would make you laugh. Photo-sculpture is the most paltry idea that ever entered into the mind of a fool. The artist has to do the best part, of course. These mechanical dodges don't help him a bit. You can't supersede brains, and study, and careful training, by any dodge of this sort. The quacks who practise photo-sculpture, and the penny-a-liners who write it up, will be found out some day. I grant you that a photograph or two of the drapery, or subordinate parts, may be useful at times in reducing the number of sittings; but to suppose that the human face, or form, with its infinite delicacies of expression, can be modelled by such a process as that, with any semblance of art, is a sort of photo-mania, if I may so call it, for want of a better term."

"But you did that charming bust of your niece that way, did you not, Fano?"

"No, I didn't! Don't exasperate me, Smith. She gave me that pose, I grant you, after a world of coaxing; and we took a dozen plates of her, which are somewhere about still. But when I came to work upon the clay block which we had cut out with the long rod against the enlarged pictures, the job proved so detestable that I shoved it on one side, and began again in my own way; and in a couple of mornings bowled it over from first to last. You see the very thing before you on that pedestal up in the corner. I had it done in marble, for it's one of my happiest works. The photo nonsense put me on my mettle, I suppose; and I worked with spirit against the machine."

"And you never used the twelve flat portraits a bit?"

"I never looked at them, I assure you."

There can be little question that the greater portion of the lewd things *published* as "life studies" are got up in quantities for quite a different class of customers from artists, and are simply intended to pander to a filthy taste. Nevertheless, there are "life studies" produced by photography which have not such a purpose. We have seen a few, very few, nude studies which were not indecent, and were beautiful; we have seen more which, without being indecent, were certainly not beautiful, the production of that weak and fatuous class of artists who confound nudity with art, and fancy when they have photographed or drawn a naked or semi-naked figure, that they have achieved something artistic. But there are other cases in which photographic life-studies, whether nude or dressed, are of the utmost value to the artist, not as "superseding brains, and study, and careful training," but as supplementing these, and reducing, not the ability, but the labour of the brain; in securing a difficult pose in a few seconds, which the model could not have sustained for hours, and which the artist could not have realised in less; in rendering an effect of drapery, which could scarcely by any arrangement be reproduced in a second sitting; in reducing the number of sittings for portraiture from fifty—which Sir Joshua Reynolds and Sir Thomas Lawrence sometimes requested—to perhaps five; and, in short, for a variety of other purposes. We do not state that photography *may* be so used, but that it *is* so used. We know of its use for these purposes in many instances. Amongst our personal acquaintances and friends we number several painters and sculptors. One of the latter, occupying scarcely second rank to any sculptor in this country, recently remarked to us, that in portrait sculpture, the value of photography could not be overstated; that with photographs of three aspects of the face, it was possible to produce a satisfactory portrait bust, with a couple of sittings instead of ten or a dozen.

In Frith's great picture of the "Royal Marriage," which attracted so much attention at the recent Exhibition of the Royal Academy, every portrait was painted more or less from photographic studies, many of which we remember Mr. Window taking for Mr. Frith. The same artist's picture of the "Railway Station" was largely indebted to photography, Mr. Samuel Fry having produced a large number of studies of different portions of the Great Western Station for the purpose. In like manner, well-selected landscape bits are eagerly sought by artists as aids to truth in landscape painting.

And here let us remark that it is rarely the first-class artist who ignores and denies the aid which art receives from photography; it is more frequently the fifth-rate artist, and more frequently still the second-rate art-critic. No true artist would ever dream that availing himself of the aid of photography would permit him to dispense with the study of nature, and there is little doubt that too much painting from photography induces a hard dry style, wanting in the freshness which nature alone can inspire; but the true artist is not the less aware that photographs of life and nature can immensely aid his studies, and serve as admirable mnemonics of the effects of nature. Mr. Sutton suggests that the sculptor makes more use of photography than he likes to own, for in a subsequent conversation in the studio we find the following remarks:—

They left the breakfast table, and Mark followed his uncle into the studios and workshops in the rear of the house.

"What in the world is this?" he asked, pointing to an inverted figure, the lower part of which was encased in what looked like a block of green glass.

"You may well ask," said Fano; "for it has puzzled wiser heads than yours. This is the first of a set of studies I am making for the decorations of a new bathing establishment. There are to be twelve of them, and they are to illustrate the various attitudes in diving, floating, swimming, and other antics. It's a capital idea, but confoundedly troublesome to carry out, because the model has to be hung up by straps from the ceiling, and can't remain long in one position. The man who won the cup in a swimming race a year or two ago superintends the posing, so that part is all right, of course."

"Photography would help you in this kind of work, I should think," said Mark.

His uncle replied by a knowing wink, and admitted that it did.

How far photo-sculpture will ever establish itself as a branch of the art which does worthy work better, or more economically, than it can be done by the sculptor, remains to be seen. We have seen good work done by this method, and Mr. Claudet called our attention at the last meeting of the British Association to an admirable portrait bust of the President, Sir Charles Lyell, produced entirely by the process, the sculptor never having seen Sir Charles at all.

The conversation on the claims of photography as a fine art is excellent, and, as we have said, we feel very much disposed to believe that *Robinson* speaks the sentiments of the author of the novel.

When Mark returned to the drawing-room, the artists were still going it, hammer and tongs, against poor mechanical photography. Smith and Brown were plaintiffs in the case, and Robinson the sole defendant. Torlonia's studies from the life had been passed on, and half-a-dozen parts of Turner's *England and Wales*, photographed from line engravings, as well as a few photographs direct from natural scenery, were before them. The wordy war was at its height, and the faces of the disputants were flushed with the excitement of debate.

"Now look here, Robinson," said Smith. "Let these two pictures settle the dispute between us. They are both views of the same place—Caruarvon Castle. One is a photograph by ——, the other is a view by Turner; each man, you will allow, a fair representative of his respective craft. Let, therefore, the comparison between these two pictures decide between us. Lay them side by side."

"Well," said Robinson. "What then?"

"What then, man? How can you ask me what then? Why one view bears on the very face of it the stamp of a machine; and the other the poetry of an artist's brain. If you can't see that, I really have nothing more to say."

"But the photographer has done the best he could. He has chosen the best spot, he has watched patiently for the best light, he has made the best use of the means at his disposal in the present state of his art; and in all this he has shown *mind, feeling, taste.* Turner himself could have done no more."

"And therefore," said Brown, interrupting the other, "the photographer, who has miserably failed in producing a *picture*, is to be accounted an artist, and photography a fine art! Because a man is able to make the best use of certain refractory mechanical means at his disposal—and which, through ignorance of better means, he is compelled to use—he is to be accounted an artist, and his mechanical drudgery is to be considered fine art. Now really——"

"Stop," retorted Robinson. "Let me finish what I had to say. We are contending for a PRINCIPLE, and you attempt to put me down by an appeal to an imperfect work, done in the infancy of a new art. Let us suppose the art of photography very much advanced in its capabilities of rendering natural truth, in monochrome, like these engravings . . . . Well, do you mean to say that a photographer, thoroughly imbued with artistic feeling, might not *then*, by a successful use of his improved appliances, and by patiently waiting for a happy effect of atmosphere and light, produce by mechanical means only, but under the guidance of a poetic taste, a *more* charming work even than this of Turner's? Might he not then—and I beg of you to think my question over carefully, and answer it candidly—produce a work compared with which all previous efforts of the human hand and brain should sink into mere puerilities, full of weaknesses and faults? Do you mean to say that the naked truth, in those most glorious aspects which it sometimes presents, is not *far* finer than any poet's vision, or any fiction of the human brain? The question turns upon this. Make it one of *principle* only, and assume the rest; and then—if you agree with me that such photography as we may conceive to lie within the possibility of accomplishment *may* one day be realized—grant me, as you *must* do, I think, on that supposition, that a photographer *may* come to be justly reckoned an artist, and his craft a fine art."

"Exactly so," said Smith. "You have now put the question fairly, and it amounts to this. Does an art of selection only, with a mechanical means of reproduction, constitute a Fine Art? Or does the term 'Fine Art' necessarily involve the exercise of the Imaginative faculty?"

"In other words," retorted Robinson, "Is an ugly, stupid picture, ill-conceived and ill-executed, to be considered a work of Fine Art, merely because it is a work of imagination; while a good photograph, exhibiting an artist's eye in the selection of the subject, is to be classed with mechanical products? Let us be more reasonable, and not talk like this. Don't bully the poor photographers. They have a hard battle to fight with the difficulties of their art, and they are getting on manfully. There are amongst them fellows of fine taste, high aspirations, and high feeling for the beauties of nature—men who have already proved themselves, I think, not unworthy to sit by the side of Gerard Dow, Gainsborough, and Cuyp. Let us help them all we can. Who knows what may come of their indefatigable perseverance?"

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PHOTOGRAPHS AT THE DUBLIN INTERNATIONAL EXHIBITION.

[THIRD NOTICE.]

Amongst the most striking examples of portraiture in the Photographic Department of the Dublin International Exhibition are the portraits of Alfred Tennyson, Poet Laureate, of which there are many. A few years ago it was understood that the Laureate had such an objection to sitting for his photograph, or its publication, that such a thing was very rare, one photograph only, and that not a very satisfactory one, having been published. Now, however, there is no lack of them. The Stereoscopic Company has vignetted and enlarged him; Mr. Mayall has done him in all sizes; Mr. Rejlander has produced a noble profile; Mr. Jeffreys has done a fine, full face; and Mrs. Cameron has done something which, according to our notions, almost caricatures him. The striking portraits to which we especially refer are, however, a series by Mr. Mayall of eight portraits from the same negative, ranging from a two-inch bust to one somewhat exceeding life size, proceeding upward in regular gradations, to illustrate the effect of enlarging. These are, with the exception of some trifling working on the eye and eyebrows, untouched portraits, and are amongst the most perfect enlargements we have seen anywhere. A similar series, and equally perfect, but looking a little less delicate from having a more weather-worn face to deal with, consists of eight portraits, in the same gradation, of Captain Grant, the associate of Speke in his Nile explorations. Another exceedingly fine portrait of Tennyson is an enlargement by the Stereoscopic Company. This is hung too high to permit us to ascertain how much is due to photography and how much to skilful touching; but if it be an untouched picture, it is marvellously perfect photography, and whether untouched or not, it is a piece of admirable portraiture, round, delicate, and forcible, and withal easy and natural.

Signor Duroni, of Milan, also exhibits some good enlargements, which are, however, considerably touched. Some very fine large vignette heads are exhibited by Mr. Twyman, of Ramsgate. These are not described as enlargements, but they appear to be such; they are well and gracefully arranged busts, vignetted into a grey background, and are very effective. Some large portraits, which are manifestly produced direct, are exhibited by Messrs. Maull and Polyblank, one or two of which are exceedingly fine, both as photographs and pictures. Mr. Claudet also exhibits a number of very excellent solar camera enlargements. M. Rolloy, Fils, Hyères, France, contributes some very good examples of the work of Dr. Van Monckhoven's apparatus in this direction. There are also some other good examples of enlargement.

Some very respectable examples of plain portraiture are contributed by the Dublin photographers, but not generally calling for special notice, beyond remarking that in some instances the effect of the pictures is entirely spoiled by showy and vulgar mounting. M. Silvy exhibits his fine portrait of the Bishop of Columbia, which we have recently noticed. Mr. Joubert has some fine card and large portraits. Mr. Robinson, in addition to "Brenda" and some other of his noble portraits which we have recently noticed, exhibits a small frame with some exquisitely perfect and pleasing card portraits. The United Association of Photography exhibits some examples of plain portraiture by the Wothlytype process, in every way excellent. Mr. Claudet contributes a number of his well-known examples of fine portraiture. Messrs. Turner and Everitt, of London, contribute a frame of card portraits of excellent quality, and very noteworthy for the unusual excellence and good taste of the frame. Hill and Saunders contribute some of the best examples of portraiture exhibited. Mr. Howie, of Southport, exhibits some portraits of the Lancashire Hussars, which are very good, and must have been effected with very brief exposure. Messrs. Window and Bridge have some exceedingly good examples of photography and portraiture in a frame of their diamond cameos. Ross, of Edinburgh, has some charming examples of portraiture, displaying much freshness of feeling. M. A. Beau exhibits some good and characteristic-looking portraits. The portraits by the magnesium light, exhibited by Mr. A. Brothers, are not only interesting illustrations of the use of the new light, but are also excellent examples of portraiture besides.

There is nothing very new in the way of photographic pictorial compositions or subject pictures here. Most noteworthy in this class is Mr. Robinson's noble composition, "Bringing Home the May," exhibited a couple of years ago in London, but which few persons would tire of, if it were hung in every exhibition. The breadth and grandeur of this picture impress us more and more every time we look at it. The richness and solidity of the masses of colour impress the beholder with a feeling akin to that produced by many of the pictures of the old masters, and there is a unity and completeness rarely attained in photographic compositions. "Autumn," by the same artist, possesses, besides the beauty of the lines and masses and the wondrous atmosphere, the same feeling of completeness which renders it difficult to realize the idea that the picture is produced from several negatives. This, we take it, is the especial characteristic of Mr. Robinson's productions which distinguishes them essentially from almost all other attempts to produce genre pictures in photography. Many others have produced clever single studies, many more clever fragments and suggestive bits, but we do not know of any others who conceived and executed such perfect compositions, complete in all their parts, having unity of purpose, of character, and of effect, not suggesting something merely intended or struggled after. The design, whatever it may be, is complete both in arrangement of lines and massing of lights and shadows. Of the higher characteristics which many of them possess, the poetry and feeling which they have in themselves and suggest in the beholder, we have not space to speak here, beyond saying that in this respect few photographs which we know, approach them. Besides the two we have mentioned, Mr. Robinson exhibits "The Holiday in the Wood," "Sunshine," "A Welsh Girl," "Somebody Coming," and some others already familiar to our readers.

Mrs. Cameron exhibits a large number of her studies, of which we have had recent occasion to speak in notices of other exhibitions. We can only repeat that, with unquestionable feeling for art, they miss the effect which that art-feeling ought to produce, from the unfortunate misconception as to the true sphere of photographic delineation which appears to govern the lady's work. Where mere suggestiveness or effective massing of light and shadow is required, the pencil can be made more available than the camera. The true scope of photography is found in securing that minuteness of detail, literalness, and perfectness of delineation which can rarely be obtained by the most trained hand in painting.

Mr. Rejlander contributes a very large number of studies to this exhibition. Many of them are old favourites, and some of them are new, the latter being chiefly confined to single figure studies. There are some of the grand old landscapes which Mr. Rejlander produced from several negatives many years ago. Why does he not give us more of the same kind of thing, which has rarely been equalled by other hands? Here, too, is the "Wayfarer," and some similar compositions produced about the same time. These are the lights of other days, which we should be glad to see Mr. Rejlander "again re-lume." Many of his single figure studies are admirable in expression, pose, and feeling, although he is, in some instances, a little disregardful of technical photographic excellence.

In single figure studies, Mr. Henry Cooper, junr., takes very high rank indeed. Besides excellent pictorial qualities, his pictures exhibit considerable of the *vis comica*, and attain the very highest photographic qualities, altogether giving us hope of a great photographic future. Bullock Brothers, of Leamington, exhibit two subject pictures entitled "Good Tidings" and "Nearing Home:" they display some industry and ambition, but the subjects trench on that province of imaginative art which is beyond the reach of photography, and the highest praise we can bestow on the results is that due to well-intended failure.

Dr. Hemphill, of Clonmel, exhibits a number of genre pictures which, in addition to excellent photography, display much poetic feeling.

Mr. Valentine Blanchard exhibits some very fine studies, displaying considerable power in a direction to which his assiduous labours in instantaneous work have not permitted him hitherto to devote much time. The pictures exhibited display great power and feeling. "A Zealot" is a forcible massive picture of a monk, in whose upturned face burn the fires which might have animated Peter the Hermit. A companion picture exhibits another monk in the character of a scholar, but withal a genial, jovial soul. The "Bride of Earth" and the "Bride of Heaven" form a capital pair, in which we like the tear-worn face of the nun best. A scene in a painter's studio, in which two pretty children play at artist and model, is clever and effective, as is also a capital portrait of Mr. Blanchard himself. Altogether, these pictures make us hope that Mr. Blanchard will do more in this direction.

One entry in the catalogue which runs thus—"Hawarden, Viscountess—Five Photographic Studies"—brings sad recollections. These pictures, like others before exhibited, are so full of grace and beauty, so original in their style, so perfect in their photographic delicacy and excellence, as well as in their pictorial arrangment, that they must bring to all lovers of photography a sense of poignant regret that the hand and brain which produced them can no more contribute to elevate the art she so loved and so adorned.

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ON THE SELECTION OF A SUBJECT, AND ITS MANAGEMENT.

BY H. P. ROBINSON.

One of the greatest difficulties in art, and one which evinces the greatest knowledge of it, both in painter and photographer, is the choice of a subject. It is not only necessary that the object be worth representing, but that it is possible to represent it at all. Many artists fail, not because they are bad painters or bad photographers, but because they have selected a theme which would be impossible to the greatest masters in either art to embody with the limited means their art places at their disposal.

Pictures seldom present themselves ready made, but they exist in all nature, and it is for the artist to find them out. Chance often presents objects which suggest ideas, and it is for the artist to "grasp the skirts of happy chance," and turn these ideas to advantage.

It is a mistake often made to attempt too much at once—to try to astonish the world at one blow. It is a vain hope. In all the world of art or poetry, or, indeed, in any other department of life, this has been seldom done, and, when done, the unlucky author has "struck twelve all at once," and has never been able to again reach the level of his first effort.

There is more art displayed in making a picture out of an insignificant subject than out of a great one; and the insignificant subjects are more prevalent than the others. So, as Pope says—

> "If Queensbury to strip there's no compelling,
> 'Tis from a handmaid we must paint our Helen,"

If it be necessary to paint her at all, especially stripped, seeing that Mr. Leighton has proved in his picture exhibited in the last Academy Exhibition that it is possible to make her beautiful without being nude—and I might remark, in passing, on the offensive folly of some artists who think that nudity *must* be art, when in most cases, especially photographic, it is mere vulgarity—the art that is obliged to have recourse to indecency to produce its effects is not an art that will elevate the mind or purify the taste.

Genius in a great measure consists in a desire for work, whatever rhapsodists may say to the contrary. It is of no use, now-a-days, marching about in long hair and a slouched hat, talking the cant of art, and smoking the blackest of pipes. However much genius a man may possess, it is of little use to him unless accompanied by that earnest energy which results in work. Much mischief is done by idle people, who, having read and misunderstood books on art, which magnify the glory of an artistic career, do nothing, after having entered the student's course, but *talk* about their own glory, and that of their occupation. "Pleasant vices" are epidemic, and the idle ones talk the workers from their work, and thus many a great artist is lost to the world. For all this it was never intended that though a man does his utmost, he should break his heart over it. An artist must be happy in his work, it must be a pleasure and a delight to him; but, as Ruskin says, "in order that people may be happy in their work, these three things are needful: they must be fit for it; they must not do too much of it; and they must have a sense of success in it—not a doubtful sense, such as needs some testimony of other people for its confirmation, but a sure sense, or rather knowledge, that so much work has been done well, and fruitfully done, whatever the world may say or think about it. So that in order that a man may be happy, it is necessary that he should not only be capable of his work, but a good judge of his work." And herein lies the great secret of all art, especially photographic art, the knowledge of what is good—in fact the power of "seeing." Learn to "see," and success must follow.

"But the eye only sees that it brings with it the power to see." By a slight stretch of poetic license, it has been asserted that a finished statue exists in the unhewn block of marble, and that the sculptor, seeing it there, merely chips away the surrounding stone which hides the statue in all its beauty from the common eye. Something analogous to this is really true in dealing with many a photographic subject. To speak of landscape, for instance. How often have I known photographers traverse miles of lovely country, full of pictures, without finding anything they thought worth exposing a plate upon — travelling from Dan to Beersheba, and declaring all to be barren. And this simply because the pictures were not isolated and cut out for them from proximity with parts of other pictures which they joined. Nature appears at times coy, and displays not some of her most seductive charms to those who have not through much wooing and constant study won her secret. The stately tree, the frowning cliff, the towering mountain, the bursting waterfall, are all beautiful, and obviously beautiful; they form fine pictures, well worth producing, but they do not make the best pictures. Some of the photographic landscapes on which my memory lingers with the fondest affection are composed of the simplest elements. Some of Mudd's, for instance, in which a calm lake is fringed with quiet foliage, a boat or a boulder in the foreground, the whole harmonious and full of atmosphere, suggesting a most delightful feeling of calm and contentment to the beholder.

I think photography has arrived at that state of perfection when we might no longer fear to acknowledge its shortcomings, and we must confess that it is not the grandest scenes in nature that make the best photographs; a photographer would be powerless to reproduce the wondrous grandeur of Chimbarazo, and the gorgeous scenery of the Andes. The best pictures produced of the Alps—those by Mr. England—fail to give but a poor idea of the "peaks and passes" of that wonderful region of mountain and snow, and the photographer has found that success was only to be achieved by the selection of "bits" which afforded him an opportunity of showing the supremacy of the camera over every other method of representing the texture and cleavage of glaciers, the geological characteristics of rocks, and the varieties of trees. Our own mountains have not been adequately represented. Snowdon, towering above its satellite mountains, has never been chosen by a photographer as a subject suitable for exhibition. But the photographer can do that which would break the heart of the painter to attempt, be he never so pre-Raphaelite. He can take a close subject and represent it literally, absolutely, and actually, without leaving a possibility for anybody to doubt his word and say that he has not photographed the truth. But he has a greater power if he choose to exercise it—he is not obliged to represent everything he finds; he may alter and select; and herein lies the power which a knowledge of true art gives over the pretender to artistic knowledge, or the simply ignorant. It rarely happens in landscape work that one single object, however grand, constitutes a picture in itself; it is the composition, the relation of parts, on which pictorial excellence depends, and which the photographer should cultivate the power of perceiving. A picture may be made or marred by such an insignificant thing as the securing or omitting of a clump of bracken, gorse, or briar in the foreground to break up a dead level of greensward. The introduction of a figure may be the crowning charm of a picture, or it may be the impertinence disturbing all repose and grandeur in it, just by the sense of fitness or unfitness which is suggested by its presence.

Here is an illustration of the application of art to photographic landscape, and it is not a hypothetical case. Two friends, both pupils of my own, selected the same scene to photograph; it consisted of a shallow stream, enclosed by trees, with shingly banks running into the river—a simple subject, but one not very tempting to a photographer who was on the look-out for views of the ready-made order. The one friend, who had studied photography simply as a science, and was very learned in formulæ and processes, placed his camera on the bank, and obtained an exquisitely perfect *map* of the scene; but with all this perfection of detail, it was unsatisfactory as a picture; it was scattered, and appeared to want balance. The other friend, who added a knowledge of picture-making to his familiarity with mechanical dexterity, first surveyed the scene, and considered what could best be done to improve it. Finding that the reflection of the distance in the water caused a patch of light to divide his picture into two parts, he caused a huge dark-coloured stone to be carried into the stream, and placed at a point he indicated; this not only broke up the objectionable light, but it placed a near dark object exactly under the greatest distance, giving greater value to the receding perspective. He now found that he had got a principle dark acting as a key note to the composition, but he had got some masses of light and half tones scattered about that required bringing into harmony. To do this he introduced a rustic female figure in a light dress, walking over the shingle to the water; and, as the figure was near, he took the precaution of posing her carefully, and supporting her with a head-rest, an instrument much despised by some and seldom used in landscape, but which, if used carefully and judiciously, would save many pictures from the deformity of blurred figures. He now exposed his plate, and the result was a picture in the true sense of the word, not a mere photograph, the mechanical product of cameras and lenses and chemicals, but a work of art, in which you saw at once that the mind of the artist had triumphed over his subject, and that all the elements of true art, except colour, although not offensively prominent, had been observed—harmony, breadth, subordination, contrast, light and shade, and composition.

It is by these means—labour added to knowledge—that good work, in painting, sculpture, or photography, is produced. Let no man trust to what is called "good taste;" it is not sufficient without a knowledge of the rules of art, however arbitrary they might appear, to produce uniformly good results; and I mean by uniformly good results, the making the best of any subject, however bad. But a knowledge of art will not allow of the choice of an unsuitable subject, and it will teach the photographer to find beauties in the humblest things, and pictures in subjects which, before he had attained a knowledge of art, he would have passed unnoticed.

A NEW ARTIFICIAL LIGHT FOR PHOTOGRAPHY.

BY JAMES WILKINSON.

Among the many purposes to which the magnesium light has been applied, photography is one of the chief. It was found that the wire, when ignited, possessed sufficient illuminating power to produce the same effect upon a sensitized plate as ordinary daylight. In many instances the experiments with this have proved very successful; there are, however, great objections and drawbacks to its more general use. In the first place magnesium itself is an expensive metal; the operation for purifying it, rendering it free from chlorine and other impurities, taking up much time and labour, all add to the expense of the substance. We all know, too, with what great rapidity the wire burns. There are, certainly, patent lamps to regulate the combustion, and it is stated that magnesium combined with other substances, such as zinc, gives off as much light, and burns less rapidly. For such purposes as exploring catacombs and caverns it may, I doubt not, be made very applicable.

In April last I commenced some experiments in photography, by taking pictures at night. The subject of the photograph was a large machine—a patent horizontal wind-engine in the course of erection in an adjoining garden. I had a very moderate lens, and the size was a quarter-plate. Proceeding in the same manner as usual to sensitize the glass, I placed the frame in the camera; I immediately proceeded to light the compound, and when, after a few seconds, it burned up with sufficient brightness, I removed the cap. After exposing for nearly two minutes, I took the plate and treated it as usual with the developer and fixing solution.

The picture came out with great sharpness and vividness, the houses near being brought out prominently. It in fact equalled any picture taken on a bright day. The mixture used was in bulk about a quarter of a pound. The length of time from which it was first lit until it finally burnt out was nearly six minutes. The utmost cost was a fraction over fourpence. The reflection of the light might be seen for two miles round. So bright was it that fire-engine authorities mistook it for an ordinary conflagration, and hurried their engines to the spot. Upon finding no trace of the fire, they returned rather chargrined, not, however, without satisfying themselves with a thorough examination of the premises. All around appeared one blaze of light; the sky looking like a mass of fire. Several times since I have made other experiments, with the same success. In bringing this preparation to notice, as a substitute for the magnesium light, I only answer for its being adapted to the production of positive pictures. If it could be used for negatives I cannot assert, as my knowledge of the art is limited to the first-named process. The principal ingredients in the compound are phosphorus and nitrate of potash, one part of the former being completely covered with two of the latter. When ready it must be placed in a tray, and stood on one side, though some distance from the camera. This light might be well used for signals at sea or elsewhere, as it could be seen at least for twenty miles.

There is no troublesome apparatus required in the production of this, and no danger from explosion or combustion need be feared while the ingredients are kept in a separate state, and the phosphorus immersed under water.

In conclusion, I would say that until some method is discovered for rendering magnesium less expensive, both in the cost of the article itself and the rapidity with which it burns, that this nitrophosphoric light may be used in many instances with great success.

[The photograph forwarded with this communication strikingly illustrates the diffusive character of the light, the building, engine, and some adjoining foliage all being well illuminated.—Ed.]

ON THE DOUBLE CHLORIDE OF GOLD AND POTASSIUM.

In a communication to the Paris Photographic Society, M. Couvreux states that for some time past he has met with constant failures in the employment of the double chloride of gold and potassium for toning positives: the paper proofs which appeared satisfactory upon their removal from the printing frame became covered with white spots, upon which the toning solution has no action. "At first," he says, "I concluded that the fault was in the paper, which, as it had been albumenized a long time, might have undergone decomposition, especially during the recent hot weather, and I had reason to come to that conclusion, because proofs on paper simply salted did not exhibit similar defects. However, by employing albumenized papers from different sources, and prepared in different baths, and the same defects presenting themselves, I was forced to recognise that the cause of them must be sought in another direction, and I discovered that they are due only to the toning bath itself. Commercial chloride of gold is always more or less acid, and when this acidity is rather strong, by adding chalk to neutralize it, a quantity, more or less great, of chloride of calcium remains in the solution: it is this chloride which, when rather abundant, forms an albuminate of lime in the toning bath, and is the cause of the spots that troubled me so much.

Having found the cause, the remedy was easy. I treated my neutral chloride with neutral oxalate of potassa. The toning improved, but still the little oxalate present in the bath gave a tendency to red hues. To avoid this new inconvenience, I operated in the following manner, and, since doing so, my toning has become excellent:—

I neutralize with carbonate of baryta instead of chalk, and afterwards add neutral sulphate of soda until a precipitate is formed. By leaving to settle for four and twenty hours, and then decanting the clear liquid, I obtain a neutral chloride of gold, which gives me the best results. I have nowhere seen mention made of the inconvenience arising from the chloride of gold containing chloride of calcium, and it may enable many photographers to account for their failures in toning by having their attention directed to it."

M. Davanne, while recognizing that the process employed by M. Couvreux would furnish an extremely pure gold bath, thought that we must seek the cause of the irregularity of the toning elsewhere than in the small quantity of salt of lime present. "For," says M. Davanne, "I have for more than six months employed the same toning bath, constantly renewed by the addition of fresh chloride of gold, according to the method made known by M. Girard and myself in our *Researches upon Paper Positives*, and yet this bath, which, by the successive saturations of chalk which it has undergone, must contain large quantities of chloride of calcium, has never exhibited the same inconveniences pointed out by M. Couvreux."

M. Couvreux, however, thought his view was the correct one; he had recommended his method to several persons, who, by adopting it, were at once relieved from the inconveniences they had previously experienced. A very simple experiment seemed, in his opinion, to confirm his view: it consists in cutting proof in two, and toning one portion in the ordinary toning bath, and the other portion in a bath purified in the manner he has prescribed, and then to compare the results presented by the two portions.

M. Regnault remarked that one of the best means of rendering the operation of toning very regular, consists in rendering the bath slightly alkaline by means of a trace of ammonia or potassa.

M. Meynier differed in opinion from M. Couvreux; he did not believe that the presence of traces of chloride of calcium in the toning bath could be the cause of the defects alluded to. It has not been shown in fact that albumen decomposes chloride of calcium, and, on the other hand, we can, as M. Meynier has done for some time past, obtain excellent toning with baths of chloride of gold and calcium, containing as much as 2 to 3 per cent. of chloride of calcium. The toning process, based upon the employment of hypochlorite of lime, seems to prove that the compounds of calcium have not the action attributed to them by M. Couvreux.

To this M. Couvreux replied, that in the cases referred to, the bath was, doubtless, a little acid, while that which he had employed was, on the contrary, slightly alkaline: this difference would be sufficient to considerably modify the results. M. Aimé Girard also could scarcely believe that the irregularities in the toning to which M. Couvreux called attention could be attributed to the chloride of calcium. It is not probable that the contact of albumen with chloride of calcium would give rise to albuminate of lime. M. Girard also thought that the interesting experiments in irregular toning made by M. Beyrich should be considered. Their object was to show that in most cases these irregularities must be attributed to the unequal dessication of the coating of albumen. When a sheet of paper is covered with albumen, its porosity being unequal, the thickness of the matter deposited necessarily presents much variation. From these different thicknesses it results that in a given time certain portions have undergone a complete dessication, while in other portions this dessication is still imperfect. Now, it is very evident, that albumen absolutely dry, converted into a kind of horny substance, becomes less easily moistened, and, consequently, attacked by an aqueous solution of nitrate of silver, than albumen still slightly humid, and consequently permeable. Hence the inequalities in sensitizing, in the quantity of silver deposited, and, ultimately, in the toning. It is to obviate these inconveniences that M. Beyrich proposes to place the paper, before employing it, for some hours in a damp cellar, to allow the albumen to recover the necessary humidity and permeability.

M. Girard thinks that, in reality, it is in the direction pointed out by M. Beyrich that we must seek the true cause of irregular toning; but whatever it may be, the communication made by M. Couvreux is none the less interesting, inasmuch as it shows a method of obtaining a gold bath of certain purity.

EXPERIMENTS TO DETERMINE THE NATURE OF THE INVISIBLE IMAGE ON THE IODO-BROMIDE FILM.

BY M. CAREY LEA.[*]

The two questions, What are the true conditions under which iodide of silver is sensitive? and What is the nature of the invisible image impressed in the camera? have been made the subject of the most important discussions which have divided photographers for years past. All the most distinguished names which photography reckons among its students, Hardwich, Vogel, Schnauss, Sutton, Davanne, Monckhoven, Russell, and others, have taken part in it, and have contributed most interesting additions to our stock of knowledge.

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[*] From the *Philadelphia Photographer*.

To this subject, which lies at the foundation of all those methods of photography that possess the greatest importance, I have devoted much time and thought, and I now propose to describe certain experiments which seem to me to throw a new light on the second question above mentioned, viz., the nature of the invisible image produced in the camera, and, in fact, to establish its nature beyond further controversy.

Before doing so, I desire briefly to state my views on both the questions spoken of, and then the proofs by which I am prepared to support those views.

First, I hold that iodide of silver is invariably sensitive, though the degree of sensibility may greatly vary according to the conditions of its preparations; that even when prepared in the presence of excess of alkaline iodide, it is capable of receiving a developable image, unless an excess of the alkaline iodide be left present. This, however, it is only necessary to wash away, when the sensibility becomes at once apparent.

This view I believe I have established by a series of convincing proofs, already published.

Second, I hold that the production of a developable image in the camera upon an iodo-bromized film is a purely physical phenomenon—that no decomposition of the silver salts takes place, no separation of iodine; and, finally, that in the wet process at least, as ordinarily practised, the image is entirely formed at the expense of the developer.

In support of this view I offer the following proofs:—

Experiment 1.

If any reduction takes place in the camera, or even any partial decomposition to be completed in the development; in a word, if the picture is produced in any way at the expense of the iodide or bromide in the film, then the iodide or bromide in the film must be removed to a proportionate extent.

In order to settle this point, I resolved to develop a plate in the usual way, and then, *instead of removing the unaltered iodide and bromide by fixing, to leave them, and remove the silver picture*, thus reversing the operation usually performed. Clearly, if any part of the iodide had been consumed in forming the negative image, the film would be left thinner in those parts which corresponded to the dense parts of the negative, and thus the negative would be converted into a thin, pale positive.

It was necessary to find a substance capable of removing the picture without injuring the iodide and bromide in the film. I found that a weak acid solution of pernitrate of mercury possessed this property, and it will be seen later with what wonderful nicety it performs its work.

The developed picture was plunged into this solution, very dilute, so dilute that about three to four minutes were required for the complete removal of the negative image. The plate was then washed and carefully examined. In none of the plates so treated could the slightest vestige of a positive picture be found. The film was perfectly smooth and uniform, thus forbidding the conclusion that any part of the iodide or bromide had been consumed to build up the negative image, either in exposure or during development.

This result seems tolerably conclusive, but the next is far stronger yet.

Experiment 2.

A plate was prepared, developed, and the developed negative image removed as in Experiment 1, except that the whole, including the application of the pernitrate of mercury, was performed in the dark-room, by yellow light. The plate from which every vestige of a picture had disappeared, and which had resumed its original appearance when first taken from the negative bath, was then thoroughly washed, and an iron developer, with nitrate of silver and citric acid, was applied. *The original image was reproduced, and a second negative picture was developed upon the same film which had afforded the first.*

That is, the impression which the light had made upon the sensitive surface in the camera was not exhausted in producing the first developed image; but after this had been brought fully out, and had been carefully removed, the same power remained in the film to produce its image a second time under the developer.

This experiment appears to me to close the long controversy, and to finally establish the "physical theory." For all the reduced silver produced either in the camera or during development is thoroughly removed by the nitrate of mercury, and there could be none left to attract the particles of silver in the second development. The simple fact, then, that this second development is possible, seems at once to establish the existence of a physical change in the iodide perfectly distinct and separate from any reduction.

Experiment 3.

In Experiment 2, both the original development and the secondary one were made with an iron developer, the gelatine developer which I have elsewhere described. In this third experiment, a pyrogallic developer was substituted in both cases, and with results at least equally satisfactory.

The observations which are here detailed were made at a period so immediately before the going to press of this number, that I have been obliged to describe them as briefly as possible, in order that they might not experience delay in publication. I cannot, however, close them without again calling attention to the extraordinary nature of the fact that the power impressed in the camera *is not exhausted in the process of development*, but after the picture arising from one development is removed, that same picture may be reproduced by another development—probably even by a third and fourth, though this I have not been able yet to test—and to the important influence which this fact must hereafter have upon the theory of photography.

Philadelphia, June 15th, 1865.

Correspondence.

AN EFFICIENT METHOD OF CLEANING VARNISHED PLATES.

Sir,—The immediate and perfect removal of the collodion film from the plate on which it has become firmly and tenaciously fixed by drying, and the superimposing of the varnish, is a desideratum much to be desired by photographers in general, and is likewise the subject of much discussion in photographic circles. Many are the formulæ for solutions employed to effect this object, some of them consisting essentially of a caustic or carbonated alkali, whilst others are slight dilutions of the most powerful acids, both of which, by acting mechanically, do their work only partially. My practical knowledge of photography is self-acquired, and only of a year's duration; but during that time I have had occasion to clean a great number of glasses which had been decorated (?) with my attempts at taking a good negative. From my little knowledge of chemistry, I considered the behaviour of the collodion film with various liquids, amongst which was rectified naptha, which, by its penetrating and solvent power, I found removed the film almost instantaneously; and I have no doubt but that it will be found the best medium for effecting the perfect cleansing of glasses which have been used. Should the varnish resist the action of the naphtha, it can easily be removed by the application of spirits of wine, and the naphtha applied afterwards. Should this hint be of any service to photographers of greater experience and practice, it will be gratifying to your obedient servant,

Thos. W. Jennings.

8, *High-street, Bridlington.*

PHOTO-BINOGRAPHY.

Sir,—I beg respectfully to say that I prefer to be judged by "scientific men who are not shopkeepers," because they have more leisure for examination of a purely scientific question than gentlemen daily occupied in trade. Sir David Brewster or Professor Wheatstone, if either of them would take the matter in hand, will leave me nothing to desire, and I think a decision on such authority could not but be satisfactory to professional photographers.

The practical proofs I have to offer are simple and tangible. In the first place, I would take a stereoscopic negative, say, of Sir David himself; from this, in the presence of witnesses deputed to look on, I will produce a life-sized binograph. Having done this, I will take from the small negative a stereoscopic print for the stereoscope.

In the second place, I will take with the same lenses a stereoscopic negative from the life-sized binograph, and print a positive from it for the stereoscope.

The proof will now lie between the two prints and the stereoscope itself: if binocular relief is seen in the picture produced from the binograph as distinctly as in that from the life, I hold it to be clear proof that binocular relief exists in the binograph. Let the stereoscope decide.

But I will go a step further. I will now cut the original stereoscopic negative, taken from the life, and hand over the best half of it to the Chairman of the London Photographic Society, or to any skilled photographer, or to any number of skilled artists or photographers, and challenge either or all, together or separately, in friendly rivalry, to produce a single enlargement from it by any process or on any surface that shall compare favourably, side by side, with the binograph as a picture. Mr. Maclise, Mr. Millais, or Mr. Ruskin to be invited to decide on the merits.

In conclusion, Sir, allow me to say, in reply to several correspondents, anonymous and known, who have broken their small wits against me, that I cannot afford to notice their personal remarks, however funny they may be.—I am, Sir, yours respectfully, Edwin Pettitt.

Birmingham, August 8, 1865.

[We accept the issue with pleasure. The test Mr. Pettitt proposes is a satisfactory one; and we should only suggest one modification to place the result beyond possibility of cavil. Instead of a portrait, let the subject be such an arrangement of objects in different planes as will render the effect of relief and distance unmistakeable. If then the single picture projected on a plane surface from a pair of stereoscopic negatives, the images superposed as described in Mr. Pettitt's paper, can be made, by copying, to yield a pair of negatives which shall give prints presenting proper relief in the stereoscope, we will readily concede the correctness of Mr. Pettitt's position, and shall regard him as having established a new fact in connection with the optics of photography. We shall have pleasure in taking part in and recording the proposed tests. Professor Wheatstone, as resident in London, would be a most desirable referee, or Dr. Tyndall, or Professor Stokes. If Mr. Pettitt will arrange and organise the tests, we shall have pleasure in assisting.—Ed.]

ABUSE OF PHOTOGRAPHY.*

Sir,—In my business walks abroad few things have more impressed me than the rapid progress indecency is making under the shield of the beautiful art of photography. Lord Campbell's Act, and the gentlemen connected with the Society for the Suppression of Vice, ride rough-shod over the offensive emanations from Holywell Street (so long distinguished for its corrupt trade), and very properly send the police, their emissaries, pell-mell, helter-skelter to seize and destroy the filth they scent, and prosecute the wretched vendors. But the worse evil of corruption, because insidious, is strangely overlooked, both by the public and the law. Photographs of women in voluptuous attitudes, with lascivious countenances, in the costume of Mother Eve, are now universally exposed in the windows of shops of great respectability in our leading thoroughfares and their intersections. I saw the other day what may be seen any day in the week—a crowd of lads and lasses, men and their wives, taking a "sly glance" at a beautifully-coloured picture of a bold and naked "Susannah before the Elders." I saw there, too, alone and amongst the crowd, a young lady, and when her eye glanced upon the picture, she blushed, and while she blushed and was about to retire, a well-dressed "gent" nudged her elbow and impudently laughed, while he pointed to the picture. Not a printseller's or fancy stationer's in London can you now look in but what are exhibited photographs of young ladies (?) at their toilette—some lacing their corsets, some exposing their legs while lacing their boots and arranging their garters, some stooping just to exhibit their bosoms, others reclining on couches in exciting postures; some, again, in their *robes de chambre* sitting on the edge of a bed withdrawing their stockings. In brief, woman may be seen in every conceivable attitude that a lewd imagination could suggest, with every conceivable sin pictured in her face. Should art be employed for debasement? The office of true art is to exalt the mind, refine the manners, and purify the passions; but here it is employed to corrupt youth and inflame the lowest feelings of human nature. The contemplation of the photographs now generally to be seen has been the ruin of many young men and women. They are wickedly suggestive; and better the art perish that ministers so much debasement to society than that it should be so ignobly and degradingly used. The women, too, who condescend to sit for these pictures, how fallen they must be—how shamelessly fallen—to make a market of their charms for the purpose of betraying youth and seducing innocence! I am told that the sale of these photographs to young men and used-up voluptuaries for the very purpose of contamination is something enormous! What a degradation is there here! that men should live who would invest money in pictures to corrupt those whom they should protect, and that women should be found to aid them in their unholy designs.

I have written strongly because I feel that the evil I now call your attention to is one of importance to the community.—Yours faithfully, J. B.

Photographic Notes and Queries.

Photographic Piracy.

Sir,—As Messrs. Spencer have chosen to supplement the correspondence in the *Leicester Chronicle and Mercury*, of which a *précis* appeared in the Photographic News, with a so-called explanation, permit us a few words in rejoinder. They say in their "explanation:"—"These cartes, the production of Messrs. Burton and Sons, were not copied and sold as cartes de visite, *nor were their pictures copied as a whole*, as stated by them, the heads only in each case being used." Your editorial note, with reference to the simple using of the heads of the portraits, that "if this be the 'head and front' of their offending, it would have been better if Messrs. Burton had passed the matter without complaint," we cordially endorse; but we enclose you one of the productions of Messrs. Spencer, where *our cartes as a whole are copied*, reduced in size merely. All the four portraits shewn are our production. You will now be able to see on which side are the "wilful mis-statements." Such disingenuousness, to call it by the mildest name, will, no doubt, cause you some surprise, but we can assure you it will occasion none in this neighbourhood.—We are, sir, your obedient servants, John Burton and Sons.

[A card enclosed gives reduced copies of the whole of four cards. This, it appears, was issued by Messrs. Spencer, a fact diametrically at variance with their statement to us. We leave the matter for the comment of our readers, as we prefer to avoid characterizing the matter as it deserves. Since writing the above, we have received a letter from Messrs. Spencer, also enclosing a print containing complete copies of the portraits on a reduced scale, which they admit they produced from the pictures of Messrs. Burton and Son, and they add that we must have misread their remarks. The explanation we published last week was their own, and in their own words. They distinctly state that the "pictures were not copied as a whole, the heads only in each case being used." We now find that they were copied as a whole, and regret that we should have been induced to publish an explanation not justified by the facts.—Ed.]

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* A correspondent, who states that the above letter has already appeared in a non-photographic paper, asks us to give it circulation amongst photographers.

Pantascopic Camera.

Sir,—I have watched with some interest the discussion in the News respecting the so-called Pantascopic Camera, the more so from the fact of my having invented a camera suitable for taking panoramic pictures; say, for instance, on plates 24 by 10.

If any of your readers can inform me how I can best get it into the market I shall feel very thankful. I cannot afford the expense of a patent, and my present occupation will not admit of my manufacturing.—I remain respectfully yours,

12, *East-street, Brighton.* W. H. Hilton.

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Talk in the Studio.

North London Photographic Exhibition.—We remind our readers that this Exhibition, to be held in the Agricultural Hall, Islington, will open on Wednesday next.

Field Meetings of Photographic Societies.—We fear that we shall be compelled to come to the conclusion that open-air meetings in connection with photographic societies are, at least in London, failures. We have attended almost every meeting appointed by the South London Photographic Society, and have found that the occasions on which an actual meeting of the members has been secured have not averaged one a year. At the last meeting of the South London Society, appointed for Richmond on Saturday last, only three gentlemen attended, the Secretary and two others. These attended at some trouble from a feeling of duty without intending to photograph. It is a pity there is not sufficient *esprit de corps* to induce the members of a society generally to meet and by their presence maintain the feeling of association which should attend such arrangements. They appear to manage these things better in the north. It seems more difficult to maintain the spirit of association or corporation in such matters in a metropolitan city.

Photography and Electricity.—The photographic records of the magnetic variations show that during last week a magnetic storm of almost unprecedented violence occurred, and which it is probable is associated with the sudden failure of communication between the *Great Eastern* and Valentia, through the Atlantic Cable. The Astronomer Royal says:—"The magnetic storm has been one of the most violent—in some respects the most violent—that I have ever known. Throughout the storm the spontaneous earth-currents have been very strong and changing most rapidly. The actions of the earth-current galvanometers have in consequence been so rapid that in general they have left no trace on the photographic sheets. From Wednesday, Aug. 2, at noon, to 2 a.m. this morning, Friday, Aug. 4, the record from our Croydon wire is, in consequence of this rapid motion, entirely lost. The record from our Dartford wire is lost generally, but occasionally some traces are visible.

The Origin of Carbon Printing.—We notice that some paragraphs have recently been sent the "round of the press" proclaiming Mr. Pouncy the inventor of photo-carbon printing. It is a pity a mis-statement should be so persistently repeated, but it is impossible to be always correcting the same error. The same paragraph says Mr. Pouncy received *the* medal at Berlin. Of course photographers know that he received *a* medal amongst betwixt one and two hundred other medallists. The editor of the *American Journal of Photography* says:—"The Photographic News has the honour of being the first of the British journals to manifest a disposition to do justice to M. Poitevin, the inventor of carbon printing. What an extraordinary case it is! In 1855 Poitevin invented carbon printing, and secured his invention in his own country by a patent. The application for the patent was, of course, accompanied by specimens of the process, and the details of the process were published. But these things were done in France, and the early publication of the process was in the French language. In 1858, Mr. Pouncy, in England, professed to have discovered a carbon process, which for a time he held as a secret, and out of which he realized a considerable sum of money. The publication of Pouncy's process showed it to be identical with Poitevin's. The processes were reproduced in this Journal for 1859, and at that time and since, in this Journal, the facts in the case were as plainly stated as now. The British journals, however, persisted in ignoring the rights of M. Poitevin, and praising Mr. Pouncy as the originator of carbon printing, and it has been a dangerous thing for a British author to take any other position. A defender of Poitevin was met with open vituperation and private slander, all in the name of patriotism.

Royal Patronage to Photography.—We have pleasure in noting that during the recent visit of the Court to Osborne, Mr. Jabez Hughes has been called upon repeatedly to produce photographs, both in his own studio and at Osborne, of various members of the Royal family. A series before us of the Princesses Helena and Louise in profile busts and standing figures, draped in white muslin, are admirable examples of tenderness and delicacy, possessing a refinement of feeling which has been too frequently wanting in the photographs of these and other royal ladies. The well-known photographic difficulty of rendering white muslin draperies has been here admirably overcome, and the pose and general arrangement are altogether satisfactory. Mr. Hughes has also had—doubtless in consequence of the success we have just recorded—instructions to photograph the Prince and Princess of Wales, and the Royal infants, Princes Albert Victor and George. It is the more pleasant to us to mention these facts to our readers, who are so familiar with Mr. Hughes as one of the ablest exponents of our art, both in writing and speaking, as illustrating the practical position achieved by his successful results with the camera, which are not less perfect than those of his pen.

Photography at Wimbledon.—During the annual assemblage of volunteers at Wimbledon, photography was busy preserving records of the meeting, and portraying various scenes and events. Mr. Vernon Heath, whose excellence in photographic landscape is well known to our readers, was on the spot, and has secured a rich harvest of fine pictures, comprising both landscapes and groups, to a display of which he has recently invited attention. Many of the landscapes are of singular beauty, which is the more surprising considering the flat, unpromising character of the landscape; but Mr. Heath has contrived from foregrounds of bracken, rendered with skill and effect, distant tents, and well chosen skies, to produce some very excellent pictures. The groups are often effective, as well as interesting as portraits. The series is very instructive to the photographer as illustrating the pictorial value of printing-in skies, by which a good picture is often made, which, without it, would have been poor and incomplete.

Photography and its Critics Once More.—Will the critics never condescend to acquire a trifling modicum of knowledge of the subjects on which they write? We do not ask for much on the subject of photography, but we should like to see them take the trouble to learn a little about facts before they express opinions. Here is the *Popular Science Review* going a little out of its way to criticise photographic art instead of reviewing science, and blundering most egregiously in doing so. In criticising the recent Photographic Exhibition in Conduit-street, amongst many other crude expressions of ignorance, we have some severe strictures on the "passion for giving pictures sentimental names with which they have nothing in common," instancing Mr. Robinson's charming portrait "Brenda" as an illustration, stating it to be a "life-study after (a long way) *Magin's* [*sic*, we presume *Magni's* is meant] "Reading Girl," with which the picture, we may state, has really nothing in common, and to which it was not intended to bear any resemblance. But as regards this supposed affectation about the name, it just happens to be the baptismal name of the young lady portrayed, as Moses might be that of the critic. This critic then goes on to talk about photographers being "very ignorant or impertinently egotistical." Photographers may with propriety content themselves by offering the *tu quoque* as rejoinder.

Photography and the Proposed Portrait Exhibition.—The *Standard*, speaking of the projected exhibition proposed by Lord Derby, says:—"Moreover, it has been suggested that the presence, in the metropolis, of pictures whose interest is world-wide, will afford a fine opportunity for the application of the resources of photography for the multiplication of the features of those personages long secluded from the public eye, yet whose deeds earned for them every claim to national gratitude. And, furthermore, the same process may wrest from the slow, but sure, progress of decay and annihilation the actual lineaments of these objects of reverence."

Applying Collodio-Chloride of Silver to Paper.—Messrs. Mawson and Swan have made a contrivance for readily coating paper with collodion for printing purposes. It consists of a hinged frame with a handle. The frame being opened, a quarter sheet of the paper to be coated is placed upon it, and the upper half is then shut down and fastened by a spring, the pressure on the edges of the paper being secured by a padding of india-rubber round the the edge of the frame. When thus closed, the frame forms a dish, at the bottom of which a sheet of paper is held flat. A groove or channel at one corner allows the superfluous collodion, after covering the paper, to be poured out.

The Electric Light at Sea.—Some interesting experiments have just been made at Lorient, on board the *Coligny*, the object of which is to utilize the electric light at sea. By means of a submarine reflector the water was illuminated to a great depth, so that it was possible to look down from the deck and see the fish, attracted by the light, swimming round the lamp as if in an aquarium. A kind of diving-bell, with a large glass eye in one side, and arranged to supply air to a diver, was also let down to the depth of thirty-eight fathoms. By means of this apparatus it will be easy to inspect submarine constructions, to fish coral, &c., and recover wrecked property. Signals were likewise exchanged, by means of the electric light, between the *Coligny* and the semaphore of Belle Isle. It is suggested that photographic delineation of submarine objects might be secured by means of this light.

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To Correspondents.

⁂ We are obliged to appeal to the consideration of our advertising friends, many of whose announcements are compelled, from the pressure on our space, to stand over.

Pantascopic Camera.—Mr. D. Winstanley, Jun., complains that in condensing his letter, which appeared last week, we made it feeble. We simply denuded it as much as possible of purely personal matters and offensive phrases, and it is very possible that such a course would, in the writer's estimation, enfeeble his production. In a controversy, each side generally believes in its own rectitude and freedom from personality. We can only endeavour to hold an even balance. In reference to Mr. Clarke's letter in our last, Mr. Winstanley makes use of some vigorous language, and concludes with the following remarks, which are to the purpose:—"I will construct an instrument at once after my own plans, and then, sir, you shall hear more, not in order that I may obtain the gratitude of one who calls me hard names, but for the cause of truth, and to silence for ever those babblers whose howls would rob an honest man of his good name, and make him 'poor indeed.'" This will be a sensible course, and more effective than a mere war of words, of which, we think, all concerned must now admit that we have published enough.

One who Studies the News.—We meant that the design and character of the table were not suitable for pictorial effect. The curtain in the one or two to which you refer was decidedly better. It is possible that the cause of the persistent mealiness in your prints may be in the water: try a bath made with distilled water. Some samples of paper seem to give mealiness in spite of every precaution; in such cases a bath of acetate of soda previous to toning has been found useful. A bath made acid by adding hydrochloric acid, and then neutralizing shortly before use, would be very likely to produce mealiness, if it were not allowed to stand long enough before use. The cause of blistering is uncertain. It occurs chiefly with Rive paper when the paper is very dry. Keeping the paper a few hours in a damp cellar before use is said to be a remedy.

Young Amateur.—If your collodio-chloride is lumpy it is due to some imperfection in the collodion itself. A very likely cause of the lumpiness you describe is the use of water to dissolve the nitrate of silver, which would cause the collodion to be gelatinous and lumpy if present in too large proportions. Water generally has the effect of spoiling collodion in this way if it be present in appreciable quantity.

J. B. S.—Dr. Van Monckhoven's apparatus is made in various sizes. We do not remember the prices. The large apparatus will produce enlargements with a shorter exposure than any we know, and the results are very excellent; but whether they are better than all the other forms of solar camera we cannot undertake to say.

O. N., Liverpool.—The examples of collodio-chloride printing you enclose are decidedly imperfect; they are over-toned and wanting in richness and vigour. It is probable that the addition of three or four more grains of gun-cotton to each ounce would be an improvement. One correspondent, who is an able photographer, informs us that with a similar sample of collodio-chloride he obtained good results by giving the paper a second coating after the first was dry. This would have a similar effect to using a thicker sample. The paper which we have found answer is that prepared by Sanford for the purpose. We find an acetate or lime toning bath and hypo fixing answer best.

Penny Buster.—When a bath rapidly discolours in the way you describe, it indicates something wrong with the bath or with the albumenized paper. In your case it is probable that the bath has become weak with frequent use, and that it is somewhat alkaline. This condition has caused it to dissolve a portion of the albumen which is now in solution in the bath and causes the rapid discoloration. If you add a little nitric acid to the bath and boil it, or heat it, the albumen will be coagulated and thrown down, and may be filtered out. Or if you expose it for a few days to sunlight the albumen will be blackened and thrown down. In either case it should then be neutralized and strengthened, and it will be ready for use. 2. The cheapest nitrate of silver may generally be used for the printing bath. 3. A variety of causes may cause an unvarnished negative to tarnish a little. Besides the readiness with which metallic silver will always oxidize, or be affected by impure air, it sometimes happens that the form in which it is reduced especially predisposes it to this effect. The use of a cyanide solution over and over for fixing will sometimes leave a trace of cyanide of silver in the film, which rapidly darkens in the light. 4. We have not heard of any special effect produced on photographic action by the late magnetic storm.

Photo.—We are familiar with the difficulty you describe, which is very common when the plate has to be kept long before development in warm weather. The remedy consists in careful attention to a few things. It is important, to begin with, that the bath be in condition free from organic matter; it should not be too strong; the inner frames of the dark slide should be quite clean, so that if the drainings of the plate come into contact with the frame, no contamination may arise from this source; the plate should rest on pieces of clean, moist blotting-paper, and a piece of wet blotting-paper should be placed at the back of the plate to retard rapid drying. In cases where, despite this precaution, the plate dries, it may be redipped in a neutral ten-grain bath, or it may be placed a few moments in a dish of distilled water and then developed, a little nitrate solution being well mixed with the developer.

J. Shamrock.—The cause of the sensitizing bath for paper turning red is its contamination with organic matter. Ordinarily it may be decolourized by shaking up with kaolin and filtering, by the addition of a little salt and water, agitation, and filtration. For persistent cases, see answer to "Penny Buster" above.

F. M. S.—A newly-iodized and colourless collodion, which fogs, may often be cured by the addition of sufficient tincture of iodine to make it sherry colour. 2. In hot weather it is desirable to work with the bath weaker and decidedly more acid than in winter, and you may also with propriety add more acid to the developer. Your negatives are over-developed or over-intensified.

Photo-Binographs.—A facetious correspondent is disgusted with the lukewarmness of those photographers who believe in Mr. Pettitt's principle and suggest further applications of it, inasmuch as they merely suggest and do not attempt to work out. He wishes to know why they don't try the effect of taking pictures all round the figure, and above and below as well, and then try to combine them. This, he suggests, would be the true mode of securing roundness.

W. H. Prestwich and J. Grimshaw.—The letters have been forwarded and will doubtless receive attention.

J. B.—We believe that *pure* gutta-percha is innocuous; but it is difficult for the purchaser to know when he obtains pure gutta-percha; it is safer, therefore, to use glass or porcelain.

R. C. C.—The unequal toning of your prints appears to have arisen from the prints sticking together in the toning bath. They should be kept moving about both in the toning bath and in the fixing bath to secure regular action. 2. As a rule, a toning bath in which carbonate of soda is added to the chloride of gold, will not keep. A bath with carbonate of soda may be made to keep by adopting the following formula: to each grain of chloride of gold add half a grain of carbonate of soda, and one grain of chloride of lime to every three grains of the gold salt.

F. R. T.—The modified Fothergill process was first suggested by Mr. Bartholomew, and subsequently independently worked out by Mr. Hannaford. It appears to give more even and more rapid results than the process in its original form. The silver should be added to the preservative just before use.

L. L.—There is no work published on photographic enamelling; M. Camarsac's process is a secret; Mr. Joubert's a patent. An ordinary transparency, thoroughly toned with gold and burnt in, would yield a purple image, but probably wanting in vigour, as there is scarcely sufficient of the metal to give a vigorous picture after passing through the fire. A process analogous to Mr Swan's, using a vitreous colour instead of carbon, would probably give good results.

S. Davis and Co.—A washing machine cannot be protected by registration. The only mode of securing the sole manufacture of anything of that kind is by letters patent.

Engineer.—Received and under consideration.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Arthur Wyatt, Fareham, Hants,
Three Photographs of Porchester Castle.
Mr. C. R. Pottinger, Promenade, Cheltenham,
Two Photographs of Charles Schrieber, Esq., M.P.
Mr. Enward Williams, The Paragon, Bath,
Photograph of a Gentleman (Bust).
Medcalfe and Evans, St. Julian Street, Tenby,
Photograph of Prince Consort Memorial, Castle Hill, Tenby.
Mr. Fred. Downer, Watford, Herts,
Three Photographs of Earl Clarendon.
Mr. George Villieas, Castle Square, Tenby,
Three Photographs of Prince Arthur in Highland Costume.
One Photograph (Composition Picture) of View of Tenby, containing Portrait of Prince Arthur.
Mr. Jabez Hughes, Ryde, Isle of Wight,
Two Photographs of Prince of Wales.
Two Photographs of Princess of Wales.
One Photograph of Prince George of Wales.
Four Photographs of Princess Helena.
Five Photographs of Princess Louise.

PATENT OFFICE

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 363.—*August* 18, 1865.

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A NEW ORGANIC IRON DEVELOPER.

"It is the best developer which I have ever tried," Mr. Hughes remarked to us in concluding his description of a new form of iron developer which had been employed for some weeks with the most complete satisfaction and success. It will be remembered by our readers that we have repeatedly recommended what has been termed the saccharo-sulphate of iron, as a developer, as giving, in our hands, a more intense negative, and working more easily with less acid than the ordinary protosulphate. In many hands this developer gave great satisfaction; but with others, from what causes it is now necessary to enquire, the results were not so satisfactory. Although sugar and protosulphate of iron in hot concentrated solutions, mixed in given proportions, gave fine crystals of a compound of the two bodies, it was tolerably clear that a true saccharo-sulphate was not formed, for on dissolving these crystals, and attempting to recrystallize, the iron salt alone, or with very little sugar, was obtained in the first crop of crystals, leaving a syruppy solution mixture of sugar and protosulphate of iron, which crystallized imperfectly, but in solution developed well. However little to be anticipated, something more than a merely mechanical mixture of the iron salt and the sugar was undoubtedly obtained, as was clearly manifested by its behaviour in development.

The Rev. Wm. Law communicated to us the details of some successful experiments in preparing a saccharated protosulphate development, which were published in our last volume, and from which it appeared that the more sugary crop of crystals obtained from second crystallization gave the best results.

Having regard to the value in development of securing an organic combination with a salt of iron, Mr. Carey Lea, to whom photographers are already indebted for many valuable additions to the progress of scientific photography, undertook a series of experiments for the purpose of securing a sulpho-conjugated salt of protoxide of iron by acting on gelatine in solution, with sulphuric acid, and, when combination was complete, adding iron filings to the solution. The result was completely successful and satisfactory. Mr. Lea's excellent article, containing details of the preparation, its characteristics, and results, will be found on page 328 of our present volume.

The process as there described, however, simple and elegant as it is, requires more care and time than many photographers are willing to bestow upon preparing a developer, if they can dispense with it; and various experimentalists began to try the value of the addition of gelatine to the common iron developer. A very useless course, as some would be ready to say, and judging *à priori*, probably not unreasonably. But the proof of the pudding, as the vulgar proverb has it, is in the eating. Mr. Hughes, improving upon a hint of a correspondent of one of the Journals, has been working with a preparation which, as we have remarked, he emphatically describes as the best he has tried. He had first tried the formula as described by Mr. Carey, and found it excellent; but having since tried the simpler mixture, he pronounces it to be not less excellent, and he is not only too well informed on the chemical questions involved, but too careful and shrewd an observer to come to such a conclusion without good grounds.

The formula stands as follows:—

Nelson's patent gelatine (it is probable that any gelatine would answer) ...	60 grains
Glacial acetic acid	1 ounce
Water	3 ounces

Mix and dissolve, which will require a few hours.

Protosulphate of iron	2 ,,
Water	36 ,,

When this is dissolved, mix the whole.

Mr. Hughes describes its properties as a developer in very satisfactory terms. It needs no alcohol, and flows readily over the plate, without any tendency to stop in irregular waves and cause stains. Although it contains only half the amount of acetic acid usually employed in the iron developer, its action may be continued a long time on the plate without any tendency to cause fog. Although an energetic developer, it is not a rapid one, but brings out the image slowly and steadily, keeping the development quite under control. By continuing its action the image gradually acquires sufficient force without further intensifying, detail being developed as well as intensity secured; the quality of the negative obtained being highly satisfactory. Finally, the solution, during the few weeks which Mr. Hughes has been able to test it, seemed to keep without change.

We took an early opportunity, after hearing these details, of preparing some of the developer, and trying it. The result was all that we had anticipated. The developer flowed over the plate like oil, in one even unbroken wave, and developed admirably. The image, when fixed, had that rich bloom which belongs to negatives of the best printing quality. The colour is good, neither as grey as an ordinary iron negative, nor as brown as a pyrogallic acid negative, but something between the two, acquiring considerably more density on drying, which it does not lose on varnishing.

Mr. Hughes stated that where it was necessary, from any cause, to secure a little more intensity than had been obtained before the first batch of the solution had thrown off, it was quite possible to add free nitrate of silver to the developer, without immediate decomposition, and that it intensified admirably and rapidly. If the silver were added in large quantity, it was easy to localise the intensity by pouring it on a given part of the negative. He had, however, found one disadvantage from using the solution to any great extent in intensifying: by repeatedly pouring the solutions on the plate an accumulation of gelatine would become deposited in patches which rendered the film unequal after varnishing.

We have not had opportunity of making many experiments in this direction: but so far as we have gone, we have not found this difficulty. We found that nitrate of silver might be freely added to the solution without sign of change for a few minutes, and that then the solution turned brown and remained clear, still doing its work, instead of becoming turbid and useless. Altogether, as to the excellence of the developer, our experience, though brief, has confirmed that of Mr. Hughes.

Mr. Carey Lea refers to the restraining influence of gelatine on the precipitation of metals, even when brought into simple contact; and it may be that in this preparation much of the excellence of the solution is due to this kind of action. We have found a similar action in the saccharated iron solutions, and the viscous character of both preparations seems to act very beneficially in allowing them to spread easily over the plate without the greasy-looking effect produced by an iron developer without alcohol, to the presence of which, in the developer, we have always had an objection. Mr. Hughes describes the effect of the proper chemical combination of gelatine with the protosulphate as very similar to the mechanical mixture, and both as excellent; but we incline to the opinion that, in making the latter preparation, some chemical combination does take place, as also in the mechanical mixture of sugar and protosulphate, as there is in the behaviour and result of both, and that of simply protosulphate solution, a marked difference. We remember a few years ago, Mr. Blanchard communicated to us the result of some experiments with modifications of the iron developer, in which he had found that the addition of glycerine was much more effective than acetic acid in preventing fogging, and that it permitted nitrate of silver to be added freely to the developer without turbidity or decomposition ensuing. By this preparation, negatives of excellent quality and intensity could be obtained with the iron alone. It had one drawback: if the nitrate bath were freely acid with nitric acid, this acted on the glycerine, producing decomposition and fogging; but with a neutral bath it gave very admirable results. Possibly this method might be worth a further trial.

THE NORTH-EASTERN LONDON EXHIBITION OF ARTS AND MANUFACTURES.

On Wednesday last the Exhibition of Arts and Manufactures in connection with the north-eastern district of London, was formally opened at the Agricultural Hall, Islington, by the Lord Chancellor and the Lord Mayor of London, the ceremony being accompanied by choral and instrumental music. This is the first experiment in holding local exhibitions of arts and manufactures, and, if successful, it is not improbable that it will be followed by similar displays in other districts of London. It is not to be confounded with the Industrial Exhibitions which have during the last year or two been held in different localities of the metropolis, its aim and purpose being essentially different.

The final object of the present Exhibition is the establishment in the district of a permanent museum, in character, if not in extent, resembling that at South Kensington. It cannot but be admitted that in the important district of which Islington forms a centre, the home of by far the greater proportion of the skilled labour of the metropolis, the establishment of such a permanent museum must prove of immense educational value; and in so far as it will be more accessible to a large share of the population for whose benefit such establishments are essentially supposed to exist, will have more practical value than the Brompton Museum can ever possess.

The various departments of art and manufacture in the Exhibition, which promise to be very perfect, do not come under our immediate province to describe. The general impression created is similar to that produced by World's Fair, but on a small scale. Here, as in the larger exhibitions,—

> Shapes and hues of art divine,
> All of beauty, all of use,

vie with each other in forming an attractive display which will, we trust, have many visitors, and further the ultimate end for which the Exhibition has been undertaken.

The photographic department, which is classed amongst the fine arts, occupies the central portion of one gallery, paintings occupying a similar position in the opposite gallery. As our readers know, this department was placed by the general committee under the entire management of the North London Photographic Association, who will have little reason to be ashamed of the result they have secured. It is, we say it without qualification or hesitation, notwithstanding some prognostications to the contrary, in which perhaps the wish was father to the thought, one of the very best, if not the best, display of photography which has ever been held in this metropolis, and, for this reason, we presume we may say in the world. As the catalogue is not yet complete, we cannot state the exact number of contributions, but they cover, we believe, a space of nearly two thousand square feet, and include contributions from almost every photographer of reputation.

Here are, perhaps, few very great novelties, the strength of the Exhibition consisting in the great average excellence of the mass of the contributions. Something of the general good effect is doubtless due to the suitability of the gallery for displaying photographs, its great length permitting the arrangement on the line of all really deserving works, and its capital light doing full justice to the good qualities of the pictures. The hanging committee appear to have done their work with great care and judgment, massing the pictures in several bays, divided by pilasters in front of which sculptured busts are placed, so as to form a pleasing general effect to the eye, whilst they have also scrupulously given, so far as hanging exigencies would permit, the best place to the best pictures. Thus, in the centre of the central bay, the place of honour, hang the now world-famous "Bringing Home the May," "Autumn," and "Lady of Shalott" of Mr. Robinson. Near to these are the clever compositions and studies of Mr. Twyman. In the centre of another bay we have the works of Bedford and Mudd; in the centre of another the fine compositions and instantaneous pictures of Mr. Blanchard, and the charming studies of Mr. Cooper; in another the Swiss views of Mr. England, surrounded by a number of capital studies by Rejlander. On a screen in the centre some exceedingly good examples of portraiture by Mr. Foxlee, and on a table a number of specimens on opal glass by the collodio-chloride process, a couple of beautiful transparencies on opal glass by Mr. W. Woodbury, by his process of relievo-printing described on another page, and some clever carbon prints and transparencies on paper, by Mr. Stone, by the gelatine and bichromate process he described some time ago in our pages. There are some very good coloured pictures, amongst which some contributed by Mr. Ernest Edwards and by Maull and Co. There is a large number of amplified pictures, some good, and others of which it may probably be more true to say that they would have been better if the artists had better understood the work than if they had taken more pains. Of all these, however, which merit any detailed notice, we shall have occasion to speak on some future occasion.

There is also, adjoining the philosophical department, on the basement, a capital display of apparatus, &c. In the optical department, Mr. Dallmeyer confines his display solely to photographic instruments, whilst Mr. Ross has a magnificent case, containing, besides photographic apparatus, a large number of philosophical instruments. In cameras, &c., we have fine cases from Ottewill, Collis, & Co., Meagher, Hare, Morley, King, and Elliott. Tents are exhibited by the latter gentleman, by Mr. How, Mr. Hare, Mr. Wright, and some others. A capital selection of glass for photo graphic purposes is exhibited by Mr. Goslett, and also by Mr. Darby. Edwards and Son have an excellent display of photographic vessels, in vitreous ware and ironstone. Mr. How and Messrs. Morson have fine cases of photographic chemicals. Mr. Harwood has some novelties for the display of stereographs and other pictures. There are also some other contributions in this department, which we shall have to notice in future.

As we have said, the North London Photographic Association have had the control and management of this department, and they have given it such unremitting attention as to secure for it at present a more complete condition than we believe is possessed by any other department in the Exhibition. To Mr. W. Hislop, one of the general committee of the Exhibition, and chairman of the Photographic Committee, the highest praise is due for his unremitting and assiduous care and excellent judgment in its general management; and to the courtesy of Mr. Sales, the secretary of the Exhibition, in giving effect to the decisions of the committee, acknowledgment is due.

The jurors of this department, consisting of Dr. Diamond, their chairman; Mr. H. P. Robinson, their reporter; and Messrs. W. Hislop, G. Shadbolt, and G. Wharton Simpson, have already commenced their duties; their awards and reports will not, however, be made for a week or two, but will be duly published in our columns.

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THE NEW PHOTO-RELIEF PRINTING PROCESS IN SEMI-TRANSPARENT INK.

BY WALTER WOODBURY.

The first operation in connection with this process is the preparation of the gelatine, which should be mixed in the following proportions :—

Gelatine	2	ounces
White sugar	¾	ounce
Water	6	ounces.

When well mixed and dissolved by gentle heat, it should be strained through a piece of fine muslin; by using a gelatine in shreds, similar to isinglass, no clarifying with white of egg is necessary, as it gives a perfectly clear solution by filtering only.

No more of this should be mixed than will be used during a week, as after that time it becomes mouldy and unfit for use.

When required for immediate use, dissolve by placing the vessel holding the gelatine in hot water, and mix in quantities as follows :—

Gelatine and sugar solution ...	4	ounces
Bichromate of ammonia (60 grains dissolved in water)	1	ounce.

If a mould bearing but slight relief is required, a small portion of colour may be added, but for general use the colour of the bichromate is sufficient to prevent the rays of light acting too deeply. This solution should be again strained after being intimately mixed, and is now ready for spreading.

Take a sheet of glass, and cover over with pieces of talc of the size required, by simply wetting the glass and then squeezing out the superfluous water, which will hold the pieces of talc firmly fixed to the glass.

Having cleaned the surface and placed on a levelling-stand, next pour the bichromatized gelatine over the surface and let it run all over the glass, but do not pour any off again. For a glass 12 by 15 the quantity given will be found sufficient. If this be done over night it will be found in its best state by morning, when it will have thoroughly set; were it allowed to dry entirely, it would take two or three days, and by that time would be perfectly insoluble in the hottest water.

When required for use, the gelatine is cut with a sharp knife round the edges of each piece of talc, and lifted from the glass, and having wiped the talc surface, it is placed in contact with the negative and a piece of glass at the back, the whole being held together by bands of india-rubber. It is now ready for exposure.

Collodion may be substituted for talc as a support, but the result is often very mortifying, as on separating the gelatine from the negative it often occurs that the film of the negative comes away with it entirely, spoiling, perhaps, a valuable negative.

We now come to the exposure. Were the negative with the talc attached to be placed in the light, an imperfect image would result, owing to the light striking the plate at all angles; therefore other means must be employed. Having a dark room facing the south, where no light is allowed to enter except what passes through a condensing lens, the negatives are placed about eighteen inches beyond the focus; this renders the image at the back of the film as sharp as the front. The ordinary solar camera answers very well for this purpose. The exposure depends mainly on the distance the negatives are placed from the focus of the condenser; in very hot weather the heat at a distance of twelve inches is so great as to cause the gelatine to melt and run down, risking destruction of the negative. It is better to avoid such risk by increasing the distance from the condenser. Nothing is lost by this, as the extra distance, although rendering the exposure longer, enlarges the circle of light and admits of a larger number of prints being exposed at once. From my experience I have found that, with a negative of ordinary density, at a distance of eighteen inches from the focus of the condenser, an exposure of one hour to an hour and a half is sufficient. Experience alone can determine the proper amount of exposure, but a little more or less is of no moment, as the effect is only carried deeper into the gelatine, and produces nearly the same result.

The gelatinized talc having been exposed, should now be laid in a dish of warm water as hot as the hand can bear, which very soon dissolves away the parts not affected by light, and by changing the water when it becomes cool, this will be thoroughly effected in about ten minutes.

The relief plates, if not required for immediate use, should be kept in a damp place, as if allowed to remain in a hot room, they would curl up and the gelatine separate from the talc.

We now come to an important part of the process, that of preparing a hard printing or moulding surface, being an exact reverse of the gelatine mould; this may be done by several methods, each possessing advantages of its own. I will now proceed to describe those I have found the best.

Firstly, by electrotyping.

To accomplish this the relief talc surface should be mounted on to a piece of plate glass; other glass would not do, as if the surface were not a true plane, a perfect result could never be obtained. This must be borne in mind in all the subsequent operations, as success mainly depends on having perfectly mathematical surfaces.

The talc may be fastened by means of Canada balsam and turpentine, and placed under pressure with a piece of blotting paper over the relief side to prevent the balsam coming in contact with the gelatine.

It must now be covered with a metallic coating of plumbago by rubbing in circles all over with a short, hard brush till it is uniformly covered, or by throwing down a coating of metallic silver as follows :—Prepare two solutions, an ammonia-nitrate of silver, about thirty grains to an ounce, and a saturated solution of Rochelle salts; mix one drachm of the latter with three of the former, and pour over the plate, which should previously have been placed on a levelling-stand and adjusted; it should then be exposed to light for a few minutes, and afterwards flooded over with a saturated solution of gallic acid: a beautiful coating of metallic silver will be the result. The plate should now be dried, and having attached fine copper wire across each edge of the glass, it is ready for the battery. If the subject of the negative have large, undetached masses of shadow, it will be necessary to allow the action to continue until a thick coating of copper has been deposited, which will occupy from five to six days; but where there are many lights distributed over the negative, a much shorter time will suffice, as a thick deposit in this case is not necessary.

Having separated the copper reverse from the gelatine, it will require mounting in gutta-percha, which must be done as follows:—Lay the copper mould, intaglio side downwards, on a sheet of thick plate-glass, and having softened a sheet of gutta-percha, place it on the copper, and having laid another sheet of plate-glass on the back, place a heavy weight over all, and allow the gutta-percha to harden.

The mould, having been well saturated with oil, is now ready for taking impressions.

Secondly, by pressure. For this it is necessary to obtain plates of polished and rolled metal of the hardness of type metal, cut in sheets of the sizes required; also two plates of cast iron, with perfectly plane surfaces, one inch thick, and a little larger than the size of the mould.

The talc side of the mould should now be laid on one of these iron plates, then a sheet of the soft metal and the other iron plate over all; the whole is then subjected to heavy pressure, either by a screw press rolling between steel rollers, or by hydraulic pressure, which will press the relief of the gelatine into the soft metal; by this means a printing surface of metal is at once obtained, which requires no mounting. The thickness of the metal should be about one-eighth of an inch.

Where a great number of impressions are required, a harder alloy of metals should be used; but where twenty or thirty impressions only are wanted, lead without any alloy may be substituted. Any number of impressions in metal may be taken from the gelatine and talc without injuring it, so that we may have a number of moulds to work from of the same subject.

Thirdly, by sulphur. This latter will prove the easiest and simplest way of producing a printing surface, though requiring some little care.

The mould should be rubbed carefully over with a little glycerine, and all that is superflous rubbed off again; melted sulphur is then poured over the surface, and a piece of plate glass laid on the sulphur, at the same time applying pressure with the hand and squeezing it into every corner of the mould; this must be done quickly, as the sulphur sets very rapidly on coming into contact with the talc; when set it will readily detach itself from the gelatine, adhering to the glass, to which it should be allowed to remain, and may at once be used for taking impressions from. A little experience will be necessary to determine the exact heat the sulphur should be used at, as this substance undergoes great changes with different degrees of temperature. I have found the best state to be when it becomes of a treacly consistency, as when dry it is less brittle. I have no doubt many other substances might be used for procuring the intaglio mould, but the above are those that I have found the most practical.

We have now got an intaglio surface from which may be moulded impressions in any colour by using a semi-transparent material composed of a weak solution of gelatine and water colour or carbon, giving all the half tones of a photograph, and resembling it in appearance, and which may be impressed on glass, paper, opal glass, porcelain, or other material.

I will now proceed to describe the press which I have used and found most suited to the purpose:—Two square pieces of wood about a foot long, ten inches broad, and two inches in thickness, are hinged together, the bottom piece being planed smoth, and the top having a piece of plate glass let into it, with a hollow behind in which are two strong springs which allow of the glass being pressed backward half an inch to three quarters: a small rabbet keeps the glass in its place.

The intaglio mould is laid on the bottom piece (the hinged top being turned back); a small quantity of colour and gelatine (warmed) is placed on the centre of the mould, the paper or glass is laid on it, and the back immediately let down and bolted. In a minute or two the press may be opened, and the paper or glass, on being lifted off, will have the moulded gelatine adhering to it, leaving the metal or sulphur intaglio mould perfectly clean: for another impression it will be necessary occasionally to rub a little oil over the surface of the mould, to prevent it from sticking.

By having several presses at work, while one is set the other will be ready to take off, and a great number of impressions may thus be made in a very short time. Very agreeable colours may be made by using lamp-black and crimson lake in different proportions, mixed with a weak solution of gelatine, just enough to cause the colour to set to a jelly in a minute or two. Prussian blue is liable to fade by the action of light, therefore should not be used.

Aniline colours may also be used if made very strong, though perhaps they might be open to the same objection, though possessing the advantage of freedom from any granular matter.

By using ceramic colours, the reliefs may be burned in, and produce very fine enamels, with the advantage of extreme cheapness.

In using paper to receive the moulded impression, it must have a very fine surface, otherwise we should have a combination of the mould from the intaglio of the photographically-produced mould and the surface of the paper, which would spoil the result by giving it a granular appearance.

In conclusion, I would state to those who wish to try this process, that they will find it a most interesting branch of photography, and possessing the charm of entire novelty.

Northwood Cottage, August 9th, 1865.

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A JOURNEY IN SEARCH OF FOOD FOR THE CAMERA.

BY A LAZY CONTRIBUTOR.

I think it will be admitted a noteworthy fact that the weather exercises as strong an influence on the operations of the camera as upon those of individuals; and that whilst typhus, cholera, and a host of other enemies opposed to the well-being of mankind follow in the remorseless track of the hot, dry, and death-dealing east wind, another set of mischief-dealing influences set off at the same time on a tour, armed with unlimited power to work ill upon the productions of the camera; else why should the bath, plates, and all that pertains to the camera suffer so much from the pernicious influences at work during the past three months? At one time it is an epidemic of pin-holes, at another a complete deadening of all the finer sensibilities of the plate, accompanied by strong feverish symptoms and a drying up of the natural moisture of the film; but no matter in what form, the enemy is with us and cannot be kept away, and dire mischief is the result of the visit.

It will not, therefore, surprise your readers when I confess that my camera has also been a sufferer. With the first bursting out of the glorious weather, some three months ago, came exhilaration of spirits—indeed, almost intoxication—and an eager craving on the part of the camera to be out in the green fields, and especially to be near water; but with the hot weather that followed came a very unfavourable change. It was slow indeed, but unmistakable. The first symptoms were indicated by a slight deadening of sensibility and accompanied by a disinclination to receive impressions, no matter how beautiful; and then followed a complete rejection of food, for plates were brought and taken away again with no indication of having been touched. Indistinctness of impressions, and, finally, the worst symptom of all, total fog, now followed. Extreme remedies were tried, but with little result. Strong acids as astringents, and unlimited quantities of alcohol, were administered with a hope to stimulate action, but in vain. Total change of air now suggested itself, but a friend well known to the editor of this Journal, and whose opinion is worth having, suggested complete repose for the camera, but in order that time might not altogether be wasted, threw out as a hint that if I ran off for a few days in search of suitable food, to be ready by the time when convalescence might fairly be expected, I should be doing all that could possibly be done. I could not gainsay the wisdom of the suggestion, and therefore started off at once.

The Isle of Wight was the favoured spot selected for the experimental trip; for it appears to offer the greatest number of attractions with the smallest number of drawbacks.

The readers of this Journal are too well acquainted with the miseries of travelling, with all the etceteras embraced in a complete photographic outfit—the camera, which, like an infant of very tender years, must be entrusted to no one's care but your own; the legs, that will insist upon coming unstrapped just at the moment when you fondly thought them patterns of correctness; the dark box, so nicely contrived, with the strap for a handle, so palpably placed that the proper mode to carry it is obvious to the meanest brain outside a railway station, but which said box is, notwithstanding the repeated caution to porters and guards, so invariably found in the break at the end of the journey, bottom upwards or standing on end. It will be no strain upon their credulity, therefore, when I tell them that it was with a feeling of buoyancy and freedom not often experienced that I found myself, in the middle of a glorious day, dashing along at a most refreshing pace towards the Waterloo station, in a hansom cab, with nothing to trouble me but a small portmanteau. I had my eyes open during the journey down, for my trip was not taken to gratify myself. It had a definite, serious object, not to be put aside for an instant. Food was needed for my camera, and I was in search of it. To the right, and to the left also, nice little bits presented themselves. Blocks of almshouses, asylums for the aged and needy, many of them monuments of the architect's skill as well as of the benevolence of the English people; an occasional village, snug and trim; now a bit of Surrey heath, followed by a view of country exhibiting the perfection of cultivation; and so on, mile after mile, as view succeeded view with a rapidity which forcibly suggested the fleeting features of the magic lantern. But with all this variety there was nothing for my camera, for it has an unquenchable, feverish desire for water, which no amount of it can extinguish, and beyond an occasional diminutive stream, fairly earning no better title than ditch, there was nothing to brighten up the landscape.

I must confess it, my camera is fastidious, and looks upon a landscape without water as presenting much the appearance of a woman in this age of super-refinement without those almost indispensable accompaniments, sparkling earrings and bracelets to match. I do not say that I am prepared to go so far, but truly water is the smile that makes the landscape radiant, and the diamond ripple on a stream reflecting back the sun is like the light in a glad woman's eye, mirroring back the love of some one stronger than herself, on whom she depends. But this is not photography, some would say. Stop awhile; I think it has to do with it. The greatest painter is he who seizes rather the spirit than the outer form of his subject, and therefore I do not think my camera altogether wrong, when it aims rather to catch the fleeting brightness of nature than its dull monotony.

Basingstoke comes at last, and with it our stoppage—a short one, it is true. At this place there is an abbey, and not without some picturesque elements, but after a little deliberation we determine not to stop here, but to go still further. We mark the spot, however, as worth a visit sometime, for the town and neighbourhood are very agreeable when seen from a railway carriage window. We are soon in motion again, however, and once more looking upon our apparently never-ending panorama. There is an unmistakable change in the character of the scene now. Far away in the distance there is the smooth, soft, velvet green slope, clearly indicating that the natural bulwarks of the south coast against the inroads of Neptune are rapidly becoming nearer and nearer, and each puff and bound and dash, with the occasional screaming obligato of the whistle, lessens unmistakably the distance between us and the chalk ridges which separate us from the sea.

Another stoppage, and we are at Winchester; but, notwithstanding, its many historical associations, and its magnificent Cathedral—not much to the eye, by the way, is its exterior as seen from the railway, but then its glorious nave makes up for all other defects, and the almost preternatural quiet of the city, shut in on all sides by the smooth-topped hills, that one might almost be persuaded that it was the lifeless city of the Arabian Tales—yet still, in spite of all these attractions for the antiquary or one seeking complete repose, we will not stay now, but soon leave it far behind. Surely, we shall now soon see water, for the monks of old were a sensible as well as jovial race, and rarely placed their abodes far from the banks of a babbling stream. We have not long to wait, for soon after leaving Winchester we cross and re-cross its track. Now it is beneath, and now again away in the distance, rounding in and out like a silver snake; now we lose it altogether for a time, only to make its acquaintance again as we near Southampton. Its character has now changed completely. A while ago, it was narrow and tortuous, with grass meadows down to its edge, and withal bright and sparkling as though glad to be so far from the contaminations of the dirty road; but now it is gradually becoming hid with importance as the future greatness of its career dawns upon it, for the masts of large ships are to be seen in the distance, and there is hard and important work to be done. Play is over now, and the bright gladness is gone. Slow and stately is its course now as it winds this way, and that gathering size and strength at every foot of progress until it opens out into a wide lake, and the noise and bustle on every side proclaim the fact that we are at Southampton at last.

(To be continued.)

Jottings for 1865.—No. 5.

BY THE PHOTOGRAPHER'S ASSISTANT.

Remarks on Double Portraiture, Printing on Opal Glass, &c.

We have heard many complaints of late among photographers, who seem to see in the horizon of futurity dark clouds arising, that portend destruction to professional photography. "The carte mania is already waning, the demand for general portraiture is on the decrease," and earnest is the desire expressed that something new might turn up to catch the public eye. In pursuit of this object, ingenious men are exercising their highest powers, producing numerous schemes and curious devices that bear witness to the inexhaustible resources of photographic art. Diamond cameos attract considerable attention, Quinque gems spring up demanding recognition. "Helioaristotypia" engages us in fruitless attempts to pronounce aright its outlandishly arranged syllables, whilst so-called binographic* images startle us by their unearthly originality. Hear what the *Daily Telegraph* has to say concerning this last style of portraiture. "An actor in private dress is seen standing by the side of himself in the costume of one of his best known characters, and Sir Roundell Palmer, M.P., discusses with animation a point of law, while Sir Roundell Palmer, M.P., attentively listens to his own lucid reasoning. The Bishop of St. Andrews in like manner hears what the Bishop of St. Andrews has to say on a knotty theological subject. The complexity of the binograph is, of course, capable of being increased to an almost indefinite extent."

Of course it is, but let us pause to enquire whether these specimens of portraiture bear evidence of healthful progress.

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* This term as applied to "Doubles" is a misnomer, having been appropriated by Mr. Pettitt in his patent.

Are they intended to astonish the uninitiated, or deemed objects worthy to receive adoption universal? Are they to be regarded as a trick performed by the juggler, or do they ask recognition as a new born relative to the fine arts? Are they expected simply to surprise the eye, or regarded capable of striking the silver chord that whispers music to a beauty-loving soul? Will the mother's fond heart throb more sweetly when the features of her long absent child are presented to her view in spectral forms? Can the double image draw a richer stream from the inexhaustible fountain of a mother's love, or is the holy impulse hushed in puzzled wonder? Will friend meet friend thus drawn with double face, and love him better for the change? In a word, can these multiple portraits touch the heart, or weave anew a wreath of friendship round the soul? Alas! we fear an honest reply to the above would be. They are only nets to catch money, bastards to art, enemies to good taste, drawbacks to the wholesome progress of photography; they are in every sense of the word unworthy of the art by which they are produced. Regarded as proofs of its obedience to the master-mind, a place might be allotted them in the studio, but as an article of commerce—let them perish.

As public teachers, photograhers should see in their pursuit a mission. Looking at the past, we see much has been (perhaps unconsciously) accomplished by them. Even the humble villager has been brought to distinguish between good and bad beauty and ugliness in art. Sooty positives on glass, and mealy prints on paper are by them severely criticised and condemned. They have plodded through the A B C of art; may their instructions turn into the legitimate path, and bear their pupils further. If for sake of present gain the right road is forsaken, money may flow in for a season, but the ebb will surely arrive, and a fresh start have to be made in the only right direction, for the human mind is so constituted that it bears within an instinctive, though sometimes latent feeling, that is wearied by constant repetition. I was taught in ancient times, that Nature held a vacuum in abhorrence. No less does she dislike a strictly perfect pair, for the Creator has set the plan that Nature's objects never should be repeated, and all the boasted rules laid down for art is a simple teaching of the same law. To a sensitive eye a repetition of lines gives pain; to a refined taste, a repetition of the same face in one picture is an abomination. Astonishment might cause a momentary thrill akin to pleasure, disgust most surely follows in its train.

Away, then, with those juggling wonders, and if something new is requisite let it be sought in perfection's path, remembering that anything that speaks not the language of art is like the drinker's sometimes impure dram, an unhealthy stimulant.

We love photographic art, and wish it well; and when we use the pruning knife 'tis with kind intent, not to produce hidious disfigurement, or to raise the spirit of anger, 'tis wielded with loving hand to lop the useless branch, to impart a purer growth to the parent stem. If the public are satiated with paper pictures, try them anew with glass, with those beautiful opal pictures that to our mind breathes loveliness and perfection. Gems that might be placed before the painter's eye, and the question triumphantly asked—"Paint ye ought like this?" A clever artist to whom a vignette on opal glass was shown, exclaimed, in our hearing, "Beautiful! this beats everything connected with photography."

There was an honest appreciation of a genuine work of art, and in order that all might know how to produce the same class of picture, we now proceed to details taught by our own experience.

So far as the collodion, mixing, &c. are concerned they have been already treated on at length in a former paper, but if we might presume to offer advice we say, except you are skilled in chemical manipulation, purchase the collodio-chloride prepared ready for use. It will save trouble and repeated disappointments, and as we are not aware of any other house manufacturing the article we break through our usual rule, and heartily recommend that prepared by Mawson and Swan. We have experimented successfully with it, and are in position to bear testimony to its excellence. The opal glass should be opaline throughout. In some samples the surface only is flashed. When the polished side is thoroughly cleaned, pour on the collodion in the usual manner, dry in a moderately warm atmosphere, and if convenient, slightly fume with ammonia, when it is ready for printing. The negative best suited for the process is such as serves for solar camera enlargements. One that is deficient in half tone and depth of shadow will produce a failure, and it must be borne in mind that a negative that gives a tolerable impression on paper will not always yield like results on opal glass. A few comparative experiments will prove the best teacher.

Having selected the negative and placed it in contact with the opal glass, now determine on the tone desired for the finished picture, if a warm one, print to a depth that would be considered overdone, but not ruinously so, in a paper proof. Should black tones be required, the printing must proceed to "roasting point." Before toning, with a small brush, run a line of black or spirit varnish around the edges of the glass, allowing it to overlap the film to prevent its slipping during subsequent operations. Now wash the picture slightly, and it is ready for toning.

In a glass measure, pour a quantity of solution from the stock toning bath, to this add two or three drops of chloride of gold, always remembering that the lighter the impression, and warmer the tone needed, the smaller the quantity of gold required, and *vice versâ*. Proceed to tone after precisely the same fashion as a negative is intensified, the plate being held at the corner by the finger and thumb. The toning must not be carried too far as it becomes deeper after fixing. Should it so happen that the picture will not reduce to the requisite point, a drop or two more gold will perform the work quickly. A slight washing follows, then fix with hypo, the usual strength employed for paper prints. In an instant the picture clears, and in a minute or two it is ready for a brief and final washing. Dry spontaneously or otherwise, and the work is complete; and if a suitable negative has been employed, your toil is rewarded by the production of a beautiful work of art. Try it.

By following out the instructions above given, failure is almost impossible; and if, during your experiments, you light upon a new idea, if it is worth anything, freely as ye have received, as freely give. Don't run away hugging your secret, and giving to your modification a crooked and absurd name; for, bear in remembrance, that photography belongs to science, and should therefore in its manifold branches bear a nomenclature that proves its scientific relations and origin. If you wish your name to be attached to your discovery, let it precede some comprehensive title, but by all means avoid the Tittlebatypes, Snookotypes, and so on, because there is nothing in these silly types that suggests contents or properties. There is no science complete that lacks a well arranged nomenclature: without it all is confusion. Photography is sadly deficient in this respect; for in its various processes the very old style is resorted and adhered to of naming each after the discoverer. Chemistry now offers a good example; let its offshoot follow a similar course, so that every name given to its productions shall be sufficient of itself to show with what materials they are produced. And except this course is followed, as in art so in science, photography will hold but feeble claims on either.

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ON MEASURING THE RELATIVE SENSITIVENESS OF PHOTOGRAPHIC PAPERS.

BY ARTHUR M'DOUGALL, B.SC.

[The last *Journal of the Chemical Society* contains an elaborate paper by this gentleman, the results of the investigation for which the Dalton Chemical Scholarship at Owen's College was awarded. We condense it slightly for our pages.]

Up to the present time no attempt has been made to represent quantitatively the changes in tint produced upon photographically-prepared papers when exposed to a known amount of light, or to express in terms of a given standard the sensitiveness of any of the photographic preparations. At Professor Roscoe's suggestion I have endeavoured to take the first step towards the attaintment of a knowledge of those quantitative relations by determining the relative sensitiveness of photographic papers prepared with varying quantities of different sensitizing agents, defining relative sensitiveness to be represented by the reciprocals of the times during which the several papers must be exposed to a constant source of light in order that they may all attain the same tint as determined by the monochromatic soda flame. As, however, it is clearly impossible to determine directly the exact times during which papers of different degrees of sensitiveness must be exposed to light, in order that each shall attain precisely the same tint, use was made of the law established by Professors Bunsen and Roscoe in their last paper on photochemical measurements,[*] viz., that equal degrees of tint upon sensitive chloride of silver paper are produced by equal products of the intensity of the acting light into the time of exposure—light of the intensity 50, for example, acting for the time 1, producing the same blackening effect as light of the intensity 1 acting for the time 50.

According to the method of measurement founded upon this law, the relative sensitiveness of the different papers can be determined by exposing them for the same time, or for different known times, to the action of a constant source of light, and by comparing the tints thus obtained with the positions of identical shade upon a strip of paper prepared in the pendulum photometer (Phil. Trans. 1863, p. 140). By reference to Table I. of the above-mentioned paper, the relative times of exposure are obtained which were needed to produce the tints in question upon the standard paper; the reciprocals of these times give, then, according to our definition, the relative sensitiveness of the papers. In most cases it is necessary that the times of exposure of the various papers be made different, in order that each paper shall attain one of the requisite tints, and not become either too light or too dark. The results obtained from the table must, in these cases, be multiplied by the reciprocals of the times of exposure, in order that the required sensitiveness may be obtained. It thus becomes necessary to determine the relation of these times of exposure with a greater degree of accuracy than can be attained by merely uncovering and covering the papers by the hand. This is effected by exposing the papers in an instrument, which may be termed the disc photometer, by means of which not only the papers can be exposed with accuracy for different known times, varying from 1·00 to 3·11, but any errors arising from variation in the intensity of the daylight are eliminated.

[The instrument and a number of experiments for testing its accuracy, which is shown to be satisfactory, are then described.]

Determination of the Relative Sensitiveness of Papers Salted in Solutions of different Salts of varying strength.

The first series of measurements was made for the purpose of ascertaining the relative sensitiveness of photographic paper salted in solutions of pure chloride of sodium, containing in 100 parts quantities varying from 0·25 to 20·0 parts of salt, and all silvered in a silver bath containing 12 per cent. of nitrate. As it was impossible to expose this whole set of papers at one time in the photometer, owing to the great difference in their sensitiveness, the several series of papers prepared in the solutions containing from 0·25 to 1·75 per cent. of salt, from 1 to 4 per cent., from 1 to 7 per cent., and from 7 to 20 per cent., were insolated at one time in the disc photometer, and the numbers afterwards reduced to the sensitiveness of the 1 per cent. solution taken as the unit. The following table gives the data of six experiments made with the 1, 2, 3, and 4 per cent. papers; the numbers obtained, as a mean of ten readings, for the relative sensitiveness were :—

Paper.	Exp. 1.	Exp. 2.	Exp. 3.	Exp. 4.	Exp. 5.	Exp. 6.	Mean.
1 per cent.	1·00	1·00	1·00	1·00	1·00	1·00	1·00
2 per cent.	1·86	1·66	1·89	1·84	1·63	1·84	1·79
3 per cent.	2·22	2·12	2·63	2·45	2·35	2·19	2·33
4 per cent.	3·23	3·21	3·29	3·27	3·11	3·06	3·19

In like manner the relative sensitiveness of the remaining papers was found, the mean of at least six separate experiments being taken. The following table contains the experimental results of determinations thus made for papers salted in the accompanying amounts of chloride of sodium.

RELATIVE SENSITIVENESS OF PAPERS PREPARED WITH VARYING QUANTITIES OF CHLORIDE OF SODIUM AND CONSTANT EXCESS OF NITRATE OF SILVER.

Percentage of Chloride of Sodium.	Relative Sensitiveness.	Percentage of Chloride of Sodium.	Relative Sensitiveness.
0·25	0·448	6·0	4·45
0·50	0·782	7·0	4·75
1·0	1·000	8·0	4·98
1·5	1·29	9·0	5·24
2·0	1·79	10·0	5·69
3·0	2·33	15·0	6·81
4·0	3·19	20·0	7·20
5·0	3·85		

Determinations were next made with pure chloride of potassium, papers being salted in solutions containing in 100 parts, 0·5, 1·0, 2·0, 4·0, and 7·0 parts of the salt, and silvered in the 12 per cent. nitrate bath.

The following numbers were obtained as a mean of three separate sets of experiments made on different days with different papers :—

Strength of Chloride of Potassium solution.	Relative Sensitiveness.
0·5 per cent.	0·815
1·0 ,, ...	1·000
2·0 ,, ...	1·48
4·0 ,, ...	2·56
7·0 ,, ...	5·26

By graphical interpolation the following table is calculated :—

RELATIVE SENSITIVENESS OF PAPERS PREPARED WITH CHLORIDE OF POTASSIUM.

Percentage of Chloride of Potassium.	Relative Sensitiveness.	Percentage of Chloride of Potassium.	Relative Sensitiveness.
0·5	0·800	4·0	2·50
1·0	1·000	5·0	3·30
1·5	1·20	6·0	4·15
2·0	1·45	7·0	5·20
3·0	1·95		

Papers salted in chloride of ammonium solutions and then silvered gave the following results, as the mean of four sets of experiments :—

Strength of Chloride of Ammonium solution.	Relative Sensitiveness.
0·5 per cent.	0·50
1·0 ,, ...	1·00
2·0 ,, ...	1·56
4·0 ,, ...	3·38
8·0 ,, ...	5·87

By graphical interpolation the following table is calculated :—

RELATIVE SENSITIVENESS OF PAPERS PREPARED WITH CHLORIDE OF AMMONIUM.

Percentage of Chloride of Ammonium.	Relative Sensitiveness.	Percentage of Chloride of Ammonium.	Relative Sensitiveness.
0·5	0·46	4·0	3·40
1·0	1·00	5·0	4·15
1·5	1·30	6·0	4·80
2·0	1·50	7·0	5·40
3·0	2·35	8·0	5·90

The following numbers were obtained as the mean of seven experiments on paper prepared with bromide of potassium :—

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[*] Phil. Trans. 1863, p. 139.

Relative Sensitiveness of Papers prepared with Bromide of Potassium.

Percentage of Bromide of Potassium.	Relative Sensitiveness.	Percentage of Bromide of Potassium.	Relative Sensitiveness.
0·25	0·345	5·0	4·41
0·50	0·767	6·0	5·10
1·0	1·00	7·0	5·74
2·0	1·88	8·0	6·49
3·0	2·59	9·0	7·36
4·0	3·34		

[It is next shown that the rate of increase of sensitiveness with increase of strength of the saline solution is different for the different salts; thus, whilst the sensitiveness of bromide of potassium paper increases nearly proportionally to the quantity of salt added up to 9 per cent., the sensitiveness of chloride of sodium paper prepared from 5 to 20 per cent. solutions increases in a very much less ratio.]

Iodide of potassium paper sensitised with excess of silver was so slightly blackened by insolation that it was found impossible to determine the relative sensitiveness of this paper.

Having ascertained the rate of increase of sensitiveness with increase in the strength of the salting solutions, it appeared of interest to determine the action of different salts containing the same quantity of haloid. For this purpose solutions were prepared containing the same quantity of chlorine combined with different metals, and papers salted in these, and afterwards silvered in the standard bath were exposed to light at the same time, the tint of each paper being read off upon a pendulum strip.

	Relative Sensitiveness.			
	Exp. 1.	Exp. 2.	Exp. 3.	Mean.
Chloride of sodium	1·47	1·50	1·53	1·50
Chloride of potassium	1·60	1·48	1·52	1·53
Chloride of ammonium	1·60	1·47	1·53	1·53
Chloride of barium...............	1·60	1·51	1·58	1·56

A similar series made with bromides gave the same results.

	Relative Sensitiveness.				
	Exp. 1.	Exp. 2.	Exp. 3.	Exp. 4.	Mean.
Bromide of sodium	1·38	1·40	1·54	1·39	1·43
Bromide of potassium	1·42	1·32	1·41	1·30	1·36
Bromide of ammonium.........	1·44	1·34	1·48	1·40	1·41
Bromide of barium...............	1·39	1·40	1·44	1·39	1·40
Bromide of quinine	1·43	1·41	1·51	1·37	1·43

The foregoing results show that the sensitiveness of papers containing the same quantity of chlorine and bromine combined with sodium, potassium, ammonium, and barium is constant within the limit of experimental error, and therefore that the influence of the metal upon the sensitiveness of the papers is not appreciable.

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THE SPHERE AND SCOPE OF PHOTOGRAPHY IN ART.

Sir,—The sage apothegm of the venerable and oft-quoted Mrs. Glasse suggests, as a preliminary to the preparation of jugged hare, "First catch your hare." Other and less practical philosophers might suggest, as a still farther preliminary, a careful study of the game laws, an examination of the question concerning public property in *feræ naturæ*, and of the abstract right of any one to preserve game. I am led to these reflections by a perusal of two articles I have recently read, both concerning art photography. I had just finished Mr. H. P. Robinson's admirable article "On the Selection and Management of a Subject." I had been charmed with the comprehensive and practical treatment and lucid style of the article, so free from vague rhapsody and the parroting of the jargon of art. In short, I had learnt something definite from it. Whilst the writer had, with characteristic modesty, avoided all allusion to his own works by way of example, and had not mentioned what has been, foolishly enough, distinguished as "composition photography," I could not help recalling many of his beautiful compositions to mind as I read the article. I remembered that Mr. Robinson was not only the apostle and practical exponent of "composition photography," but at one time risked becoming its proto-martyr, when it was designated the "patchwork" heresy. I thought, however, that the said heresy had, like many other heresies, finally been acknowledged as truth, and was now, amongst photographers generally, including even former opponents, regarded as sound doctrine.

I had just, as I have said, concluded reading this article, and had been revolving these ideas in my mind, when I took up another journal, and read a paper which had been brought before the Edinburgh Society by Mr. Slight, and which was entitled "Concerning Art Photography." In this paper I found all the old arguments against "composition" or combination revived, as though they had never been discussed or exploded. Let me here remark, that I should be sorry to say one word which might seem disrespectful to Mr. Slight, whom I have not the happiness to know, but who is, I doubt not, a very worthy gentleman. His paper contains a calm and fair expression of certain opinions, and it is with these and their soundness, or the contrary, that I am concerned. I hope it is possible amongst photographers, to differ in opinion without entering into personal quarrels. Well, Mr. Slight's opinions appear to me to be erroneous, and calculated to retard the progress of our art. If Mr. Robinson's paper was practical, and gave an excellent recipe for cooking my figurative hare, Mr. Slight's stopped me at the threshold of my operations by insinuating, that, in catching the hare, I should be poaching, and that, moreover, it would prove very unsatisfactory food.

To drop the metaphor, Mr. Slight urges against "composition photography" that it is untrue. His arguments bring us back to a point which I had imagined was, amongst photographers at least, definitely settled, namely, the sphere and scope of photography in pictorial art. The general subject is a wide one, but a discussion of Mr. Slight's objections to "composition" will pretty well cover the general principles involved in the larger question. His first objection is on the score of fitness. He says, that a statue carved in ice, however skilfully done, would offend, rather than please, because of the want of a sense of fitness in the material for the rendering of sculptured forms. The argument here, so far as it is derived from the unfitness of the material, at once falls to the ground, because the material upon which the photograph is produced is the same as that of which an engraving is printed. But I apprehend that the illustration is chiefly meant to imply that unfitness may destroy the value of otherwise good work, and thus bear on the argument which follows, to the effect that the universally received notion of the absolute truthfulness of photography unfits it for the rendering of any pictorial grouping, which is due to the arrangement or composition of the artist, whilst the less truthful character of the painting permits it to be employed in giving embodiment to any idea the artist may conceive, whether it have a real existence or not. Photography, in short, is to be confined to the rendering of facts as they are, whilst painting may render facts as they might be. I will, however, in order to be exact, give Mr. Slight's argument in his own words:—

"This wonderful and almost unavoidable power of truthfulness to nature we are getting so accustomed to, as to almost lose sight of its belonging peculiarly to photography. But it is certain that this constitutes its greatest charm; for, however inartistic a photograph of natural scenery may be, we have at once, on looking at it, a feeling that it is at least true. . . . It would thus appear that the great peculiarity or key-note of photography is truthfulness."

This truthfulness, Mr. Slight thinks, may not only be dispensed with, but is unattainable in painting. He says :—"In the older art of painting, the artist took nature for his model, and was able, by the addition of interesting and possible accessories or the omission of unpleasant features, to compose a picture, in some respects, more beautiful as a work of art, than could have been achieved by a literal rendering of the various objects which it included ; but the peculiar charm of strict truthfulness was neither demanded nor looked for, because it could never be attained, being simply impossible."

Now, the first fallacy which strikes me here, arises from the confounding of the idea of fact and truth. Mr. Slight seems to think that a thing cannot be true if it is not a fact. But truth in art is like truth in ethics. A thing may be perfectly true to nature, without existing as a fact in nature ; whilst, on the other hand, it might have an existence, as a fact, without being true to nature. I will show how. A painter or photographer may produce a landscape with figures, the latter of which may never have been near the scene of the landscape ; but they may be so correctly lighted and arranged, and in such admirable keeping and harmony with the scene, that every one at once feels the picture is true to nature, although it may never have had, in its entirety, an existence as a fact. The photographer may, on the other hand, photograph an actual scene in which, by the introduction of incongruous figures—such, for instance, as a man in the robes and chain of a lord mayor carrying buckets of water, or a cat before a plate of cherries, which would be correctly pronounced untrue to nature and art, although the scene had existed as an undoubted fact.

But I think I may easily go further than this, and affirm that, without the perpetration of any wilful incongruity, photography is by no means necessarily nor always true. Not only can it not render the truth of colour, but it frequently fails to translate colour fairly into monochrome, both in portraiture and landscape : witness the rendering of red hair and blue eyes in the one, and deep green and yellow foliage in the other. If a lens of short focus be improperly used, look at the gross errors in perspective produced. If a single lens be used for architecture, upright lines are rendered by curves. If a picture be under-exposed or otherwise mismanaged, a scene in nature suffused by sunlight is rendered in the photograph by a series of harsh black and white patches. By imperfect lighting and injudicious posing, the form of features may be quite altered. By the management of exposure and development, a fine skin may be made to appear rugose, or a coarse skin fine. By the management of accessories, &c., a short person may be made to appear tall, or a tall person short. I should be sorry to be misunderstood in these remarks. I am not decrying photography, of which I am a most enthusiastic votary ; but I am simply suggesting that since it can, and often is, made to tell or suggest all kinds of untruths, an argument based upon its "unavoidable power of truthfulness," suggesting a sense of unfitness when it is employed to render something which has not an existence as a fact, must very soon fall to the ground.

Then as to painting. Without going into the arguments of the pre-Raphaelite Brotherhood as to the power and duty of rendering the truth as it exists in nature, I think that few persons who have studied the subject will hesitate to admit that painting is capable of more perfectly and comprehensively rendering nature truly than photography can possibly do, both in portraiture and landscape. It is not necessary to enter into an elaborate argument to prove this, nor is it of much importance to recal the traditionary illustrations of the literal truthful power of painting, such as the dish of fruit which was painted with such truth to nature that the birds came to peck at it ; or the story of the horse which was so well painted that another horse neighed its recognition ; nor the story of the painting of a curtain over a picture executed with so much skill that when the picture was exhibited the painter was requested to lift the veil. These stories may be true or not, but they illustrate that the capacity for rendering literal truth is one of the recognized powers of painting.

I have referred to the possible untruth of photography and the possible truth of painting, not to base any elaborate argument thereon, but to show that Mr. Slight's argument as to fitness, derived from the notion that literal truth is a dominant characteristic of photography, and possible falsehood an equally dominant characteristic of painting, really has very little weight indeed.

I think, however, that the consideration of one or two practical cases is more valuable in a question of this kind than any amount of abstract argument. Let us suppose a case. In my pursuit of the picturesque, I have selected a very charming landscape which I intend to photograph at a given season of the year, when the character of the light, the foliage, &c., are best suited for photographic pictorial effect. An important element in this picture is a noble tree, without which it becomes tame and insignificant. When I come again to the scene, I find my tree cut down, and in its place is a square, ugly little wood-shed, in which the tree is being cut up into faggots. Not very far distant, however, although quite out of my composition, is another similar tree, of which, if I secure a negative, and masking out the wood-shed, print this tree into the place where the other stood, will anyone tell me that my picture is not true to nature ? Again, if I find that in taking a landscape with figures, some of my figures move, and I find it desirable to secure them again on a separate negative to be printed in ; or if my foreground, containing dark foliage, requires long exposure, and my sky, containing light luminous clouds, requires short exposure, and I take one negative for the sky and another for the landscape, shall I be told in either of these cases that I am violating truth ? I think not. If, then, composition or combination printing be permissible so long as it be done truthfully, the whole argument is, I think, granted.

And this brings me to the real question at issue—the sphere and scope of photography in art ; and I have no hesitation in affirming that whatever photography can render in pictorial art which is in conformity with truth in nature and truth in art, comes within its sphere, and success in such truthful rendering is, as I think the Editor of this Journal has before laid down as an axiom, the touchstone of legitimacy. If the picture produced be in perfect keeping with the truth of nature and the principles of art, it is a legitimate result. Untruth of any kind might be an argument against any individual picture, but not against the principle in discussion. Untruth in painting would be no more justifiable than in photography. When Millais, in his celebrated "Apple Orchard," painted grass about twenty inches high, at the same time when apples were in blossom, and when the grass could not well have grown more than four or five inches high, he perpetrated an anachronism which excited much good-humoured satire. When Landseer painted a child just rescued from the water, with clothes of faultless cleanliness and dryness, Ruskin asked, "Would not its clothes be wet ?" These were blunders ; and if the photographer were to blunder in an equal degree, he would probably meet with more merciless criticism. But in examining a composition like Mr. Robinson's "Autumn," or "Bringing home the May"—and I would here beg that gentleman's pardon for introducing his name so frequently in this letter : that I can find no other illustrations so suitable must be my excuse—in examining such pictures, I say, we have neither untruth nor incongruity. We have actual English scenery such as is to be found in Warwickshire ; we have English rustic figures engaged in common English rural occupation. Every part is true in detail, and the whole is harmonious and true in keeping. There is an absence of anything which suggests patchwork ; it looks as if to use Ruskin's words, "it had been gathered straight from nature." If I may be permitted, I should like to quote a paragraph on the subject, which strikes me as going right to the point; it is from a notice of "Bringing home the May," in the Photographic News, November 1862; and I remember it struck me at the time as covering the whole argument of the legitimacy of "composition photography." The writer says:—

> There is that harmony which renders it difficult to remember that this is a "composition" picture, in the photographers' technical sense of the word. It is difficult to believe in it as the product of several negatives, each part so thoroughly belongs to the whole and so perfectly accords with the whole. Ruskin, speaking of the test of the true artist, says that his work, or the "imaginative work," as he calls it "looks always as if it had been gathered straight from nature, whereas the unimaginative shows its joints and knots, and is visibly composition." The test is an admirable one and admirably put, and may, with augmented force, be applied to the "composition," or rather let us call it, as referring to the mechanism, the "combined" pictures of the photographer. It is when this test is applied that the picture before us claims its true position as an imaginative work. We do not see the "knots and joints," we do not mean the joints in printing, but in working out the conception and composition. Let us add, for the benefit of young photographers who may be tempted to tread in Mr. Robinson's steps, that a work of this kind cannot be produced from a crude conception. Months before this picture was commenced, we received from the artist a well-drawn sketch, in which the design and composition of the intended picture were fully indicated, these being specifically settled before a negative was taken.

The argument with which Mr. Slight attacks the use of "composition," and I think fails to touch it, comes with real force, however, against its abuse or misapplication. When he speaks of a picture which "consists of scraps collected from various quarters of the world," he describes that which would be incongruous and untrue, and not less so in painting than in photography. If, in the first illustration I supposed, of substituting a tree for a wood-shed, instead of printing in a tree belonging to the scene, a huge palm tree had been introduced, that would have been untrue, incongruous, inharmonious, and unsuccessful. It would not be more true if, by some possibility, a palm tree had been brought from Kew Gardens and placed in the English landscape for a few minutes, and then portrayed without combination printing. Without multiplying illustrations, I think it will be readily seen that pictorial truth is one thing, and a literal fact another, and that a picture may be incongruous and untrue in art, whilst it represents a literal fact.

There is one thing in which I express my hearty agreement with Mr. Slight. There are undoubtedly fields of art to which photography is totally inapplicable, whether by combination or single negatives. It is not suited to the rendering of imaginative art. In the ablest attempt of this kind, Mr. Rejlander's "Two Ways of Life," a work in many respects of great ability, photographically and pictorially, there was suggested to most minds a strong sense of unfitness. The allegorical nymphs, with which the picture was crowded, were not abstractions, but literal portrayals of naked women; and the unsuitability of the means to the end impressed everyone with an uncomfortable sense of incongruity.

There is another class of pictures produced by "composition" or combination printing which are still more offensive and incongruous. I refer to the class of thing typified by a picture I have seen exhibited, entitled "The Spirit's Flight." Here photography is employed to portray the disembodied spirit winging its course to regions no mortal eye has seen. Apart from the liberty taken with a sacred subject which will jar on the feelings of many, the utter impossibility of such a thing ever being presented to the camera, the absolute certainty that the figure is that of a young woman in the flesh, travestying the ideal rendering which imaginative painters have given to spiritual beings, at once impresses the beholder with the untruth of the whole thing. It is not only not a fact nor possible to be a fact, but it is alike untrue to nature and art, and carries its untruth and incongruity on the surface. All that Mr. Slight says on the question of truth applies forcibly to this class of work, and the application of the art to that of which it is in its own nature incapable, simply brings it into ridicule, and cannot be too strongly reprehended.

The abuse of anything is, however, no argument against its use, and I think that it will be admitted by a gentleman so candid and straightforward as Mr. Slight seems to be, that photography may legitimately extend its sphere into the regions of pictorial art, by employing either one or half a dozen negatives, so long as it produces nothing incongruous or unnatural, and so long as its productions are true to nature, whether they represent some actual fact which existed as an entirety or not; but that photography, whether one negative or twenty are employed, steps out of its sphere in attempting imaginative art, and the embodiment of those creations of the fancy, those airy nothings to which the poet and the painter can alone give a local habitation and a name. Respice Finem.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, August 16th, 1865.

The efficacious action of light upon alkaline bichromates, mixed with certain organic matters, has given rise to numerous printing processes, which turn to account either the reduced chromic acid, or the modified organic matter. Several of these processes are applied to the arts, and are too well known for it to be necessary to mention them here.

M. Poitevin has just made an ingenious application of the same principle, by using chromic acid unaltered after exposure to light transmitted through a positive cliché, in order to produce upon certain parts of the paper chromate of silver, which he transforms into chloride, bromide or iodide of silver, thus obtaining a surface which, on being exposed to the light, will darken in the parts that were protected during the first exposure. This means allows of positive pictures being obtained when positive clichés or screens are employed.

The following is the mode of proceeding:—A solution of bichromate of ammonia is made—10 grammes to 100 grammes of water. This is mixed with an equal volume of saturated solution of alloxantine or of any other organic matter that oxides with chromic acid under the influence of light. The author here observes that alloxantine is the substance which, for the present purpose, reduces the bichromate most completly, as in fact he recognised as early as 1858 (*Traité de l'Impression sans Sels d'Argent*, 1862; page 132 and following). Salicine, gum, sugar, &c., may be substituted, but with less advantage.

One side of the paper is applied to the mixture, which has been poured out into a dish; or, to do the thing more simply, the paper is coated as carefully as possible by means of a brush, and then left to dry away from the light.

It is exposed for four or five minutes to the sunlight passing through a positive. Then the side that has been exposed is applied to an eight or ten per cent. nitrate of silver bath. A very fine, but not permanent, positive picture is thus obtained—red upon a white ground. It is necessary to wash it several times to remove the nitrate of silver, and to add to the last water employed a few drops of water containing five per cent. of hydrochloric acid. The red image disappears, and is replaced by an inverse image—white upon a slightly tinted ground. It is again washed to remove all traces of hydrochloric acid. The paper is left to dry in this state, or is placed between sheets of blotting paper. When dry, or nearly so, the side bearing the image, which is now formed by chloride of silver, is put upon the same bath of nitrate of silver; the paper, while still wet, is applied to a very clean glass, and made to adhere thereto, the nitrate side being in contact. It is then exposed to a strong light, with the glass uppermost. In the presence of the nitrate the chloride of silver darkens very rapidly, whereas the light parts of the paper are preserved, no doubt on account of the presence of the bichromate, or of the reduced chromic acid. Exposure to the light is discontinued when the image seems sufficiently intense. The picture is now well washed, and afterwards fixed by the usual methods.

This process, which is one of the easiest, admits of the copying of manuscripts, and of drawings upon transparent paper, as also of printing by means of positives obtained in the camera. It may also serve for the printing of amplified pictures, by first obtaining an enlarged positive upon ordinary negative paper, and then by printing off upon the paper just described as many copies as may be desired. In printing a large number of copies, as for books, &c., several positives may be photographed from a given negative upon one glass, and then this glass may be used for printing several pictures at once upon the bichromated paper.

As already mentioned above, the nature of the organic substance mixed with the bichromate is not a matter of indifference for the result; nor is the quality of the paper.

The pictures presented by M. Poitevin greatly interested the members of the Society. Apropos of this communication, Mr. Bingham observed, that a process which appeared to him analogous with M. Poitevin's had been published several years before, by Mr. Robert Hunt. I sought for the document relating to this process, and found that Mr. Hunt had, in fact, previously to 1853, given the description of a method which he called *chromotypo*, and in which the paper was coated with a double solution of sulphate of copper and of bichromate of potash. After exposure to the sun, he obtained a negative of a brown tone; but by prolonging the exposure, the image became positive—yellow upon a white ground. He then washed it with a solution of nitrate of silver, and then with pure water. If the picture grew feeble, it was sufficient to again expose it to the light. From red it became lilac, "the shades of colour" he added, "depending upon the quantity of salt used to decompose the chromate of silver, which forms the shadow parts of the picture."

At the same meeting, M. Hermagis communicated a process for the preparation of the paper intended for amplified pictures. The following is a summary of it.

1. Mix 20 grammes of starch, with 250 grammes of distilled water.

2. Add to this, while still warm:—

Chloride of sodium…………	20	grammes
Sugar candy…………………	0 50	,,
Tartaric acid ………………	0 50	,,

3. With a fine sponge, spread this starch, warm, over the sheet of paper.

4. With another sponge, fine and damp, regularize this layer, and remove the excess.

5. Dry in the shade or in the sunshine, and keep the sheet free from damp.

6. Sensitize, when wanted, by means of a sponge soaked in a 20 per cent. solution of nitrate of silver.

7. Dry, expose in the camera, and observe the outcoming of the picture.

The picture of natural size (cliché of eight centimetres), which M. Hermagis presented to the Society, took 40 minutes. In general, albumenized paper requires double time; two hours and a-half, and at times, three hours.

8. Toning by means of M. Bayard's bath, containing hydrochlorate of ammonia.

9. Fixing by means of hyposulphite of soda.

The advantages of this method, according to the author, are the following: economy, simplicity, shorter exposure, solidity.

Ernest Lacan.

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Photographic Notes and Queries.

Field Meetings of Photographic Societies.

Sir,—In reference to the statement in the News of August 11th, relative to the few members of the South London Photographic Society who met at Richmond on Saturday, August 1st, and the remarks you make thereon, permit me to observe that, as a professional member of the society, I find, that during the summer season, Saturday afternoons are the busiest of the whole week.

This, no doubt, being the case with many others, may be one reason why the meetings are not so successful as regards numbers; but is it not practicable to appoint some "hostelry," where members occupied during the afternoon at home could join their brethren, who, having leisure at command, have attended the call for two o'clock?

If such place and time, say six or seven o'clock, were known, perhaps many would run down to spend a social hour together, and thus one of the great ends sought by our society, viz., association, might be brought about.

A notice in the News the week previous to the next meeting would suffice. E. C.

[The suggestion is, we think, worthy of attention.—Ed.]

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Talk in the Studio.

The North London Photographic Exhibition and the Daily Press.—The display of photographs which the North London Photographic Association has had the duty of organising at the Agricultural Hall has met with the highest praise and appreciation in all quarters. The *Daily News* says it is "probably the finest collection of photographs ever exhibited in London," and again, "Next to the pictures in oil, but far beyond them in interest, are the photographs of all sizes, and representing all manner of subjects. The sun, the true pre-Raphaelite, has here been made to do wondrous duty in painting landscapes and groups, and single faces and figures: Mr. Robinson sends some extraordinary specimens, and Mr. Simpson introduces his new method of taking portraits on opal glass." The *Times* says:—"The collection of photographs is far above the average." The *Morning Post* says:—"The photographic collection has been brought together mainly by the members of the North London Photographic Association, and it contains some very admirable specimens by Mr. H. P. Robinson. Some of the specimens are of unusual dimensions. One picture, made up from natural figures, is 'Bringing Home the May;' another is 'A Musical Party' [this is really one of Mr. Twyman's pictures], and a third a rural subject, 'Autumn.' There are also some excellent pictures of still life, copies of ancient buildings, wonderfully clear and distinct interiors—in short, there is a gallery of several hundred specimens, many of which test alike the extraordinary ability of the operators, and the artistic manner in which the originals were grouped and arranged." The *Standard* says:—"A large space in another gallery is appropriated to an admirable photographic collection. This is the one branch of the fine arts which is here worthily displayed. The best photographs are not wholly beyond the reach of men of moderate enterprise and capital, and the labours of the North London Photographic Society, by whom the whole of this department has been organized and arranged, have been crowned with complete success. They have collected a number of photographs which, in their wonderful distinctness, combined with a clever management of light and shade, convey a most striking impression of the vast resources of the most remarkable artistic invention of our age." The *Telegraph* and other papers speak in similar terms.

United Association of Photography.—We learn from a recent announcement of this company that notwithstanding the heavy expenses necessarily contingent on the organising of a company, the purchase and introduction of the Wothlytype printing process, &c., the earnings of the company have been 14 per cent. on the paid up capital, the amount being really earned in four months of their financial year. They have accordingly declared a dividend of 7½ per cent., taking over the remaining 6½ per cent., we presume, to a reserve fund. They have resolved on now issuing the remainder of their unissued shares.

Mr. Twyman's Portraits at the Dublin Exhibition.—Mr. Twyman, of Ramsgate, informs us that the portraits we noticed last week in the Dublin Exhibition, as being enlargements, are really taken direct in the camera of the full size.

Royal Cornwall Polytechnic Society.—We again remind our readers that the Royal Cornwall Polytechnic Institution has an exhibition of works of Art and Industry early in September, when prizes and medals are awarded for superior excellence in the different departments. The Council and Secretary have, for several years, bestowed much attention and care on the photographic department, and photographers have met with greater courtesy, and have had more liberal arrangements made to display their works, than by any similar society in England. The Institution during its Exhibition attracts large crowds of the wealthy and art-collecting residents of the western counties, and the sale of choice specimens is very considerable. Professional operators would do well, then, to "be in time," and will be furnished with every information on their applying to the fine art secretary, Mr. Sidney Hodges, Royal Polytechnic Hall, Falmouth.

Photographic Advertising.—One of the contributors of our facetious contemporary *Fun*, gives the following *morceau* as the actual announcement, *verbatim et literatim*, of a photographer at the sea-side retreat, at which the said contributor is rusticating :—

Artistic Photography.
Cartes de visite Vignettes or white bock gro*m*d.
A large and splendid exhibition of photography alwa*ias* ope*u* free
Photographi*cal* waiting rooms and Cabinets de Toilette.
M. A—— engages te furni*st* vi*eur* of all the principal Monum*ent* public buildi*ng* or carriages *horses private houses &c. lbe* undertakes the production of portraits of persons ill or after death at their own residences.
A large assor*ti*ment of *t*rames of all kinds, albums, brooches, lockets, stereoscopes, medal*lons*, micr*ophocos*, &c., &c.
All chimicals for photography at wholesale price.
DEPOT for albumi*n* paper.
Stereosco*picat* views of *oll* Europ*eane* countries.

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To Correspondents.

⁂ Mr. Sayce's Collodio-Bromide of Silver.—In response to several enquiries and applications as to the supply of collodio-bromide of silver ready for use, Mr. Sayce, who has no commercial connection with photography, has consented to supply for a short time, examples of the preparation for the convenience of amateurs. On receipt of the amount in stamps, Mr. Sayce will forward bottles packed in tin case and wooden box, at the following rates:—20 ounces, 15s.; 10 ounces, 10s.; or 5 ounces, 5s. Mr. Sayce has made this arrangement at our suggestion, and we hope it will be found a convenient aid to trying the process to many of our readers.

G. T. C.—The address of Mr. Breese, by whom the charming transparencies at the Dublin Exhibition were produced, is Acock's Green, near Birmingham.

J. C. H.—You will find detailed formulæ for printing on opal glass with collodio-chloride of silver in the News of April 28th, and of May 12th. The best method of making suitable pyroxyline is that described for negative collodion in our last Year-Book. It consists in the use of nitric acid 1·420, and commercial oil of vitriol equal parts, and immersing the cotton at a temperature of from 140° to 150° Fah. A toning bath of sulphocyanide and gold may be made as follows :—Chloride of gold, one grain ; sulpho-cyanide of ammonium, six grains ; water, four ounces.

James Thomas.—Neutralize the solution of gold with carbonate of lime. You may estimate the strength of a gold solution by precipitating with a standard solution of oxalic acid. We cannot describe the process in detail in this column ; but will give the method recommended by Mr. Francis Sutton, in his "Hand-book of Volumetric Analysis," in our next.

Nudrog.—A good lens for card portraiture may be used for enlargement ; but a triple is preferable. 2. To enlarge a card picture to 12 by 10 requires enlarging about four diameters ; a quarter-plate, enlarged to the same size, would require amplifying rather less than three diameters. It is the number of diameters, and not the number of superfices, which is understood in enlargement. A plate three inches square enlarged three times would give you a plate nine inches square. It is the number of diameters which is referred to in our enlarging table in the Almanac. 3. Ordinary gas-light, with any kind of reflector, would be exceedingly slow in enlarging.

A New Subscriber.—The deposit to which you refer is doubtless gold, and when it occurs your bath is impoverished to that extent. A toning bath to which carbonate of soda has been added will rarely keep. The chloride of lime and gold bath will, however, generally keep well, provided it stands in the dark, and nothing which would contaminate the solution comes near it. One common cause of decomposition is putting dirty fingers into the solution, fingers which have perhaps recently been in contact with hyposulphite of soda. If the bath be made, and kept according to instructions, and is not touched with dirty fingers, it ought to keep. The chalky water in which the prints are washed ought not to affect it.

"Amateur."—We do not quite understand what you mean by a "design in book work." If the design be a picture, it can be registered in the same way as a photograph, and on the same terms. If an ornamental design, it must be registered at Whitehall under the Designs Act, and will cost about a guinea, we believe. In the latter case you had better place it in the hands of a patent agent.

A Landscape Painter.—The common white gas piping will answer perfectly for the worm of a still.

Annie.—The spot is caused by imperfect fixation. Probably your hyposulphite solution was getting old or weak, or possibly an air-bubble had formed at the spot. It might also have been caused by the print having been touched with hyposulphite just at that place before it was fixed ; or it might have been caused by a trace of hyposulphite (used in manufacturing the paper) being in the original paper just at that spot. In any of these cases the final result would be brought about, namely, the formation in the print of insoluble hyposulphite of silver, which, subsequently decomposing, causes the yellow spot.

Curioso.—We have published several articles recently on the production of "Doubles." You will find full information on the subject in Mr. Robinson's article in our pages in the number for March 31st. In those to which you refer as registered, it is the individual picture which is registered, not the mode of producing them.

Polypodium.—We believe that the full details of "nature printing" as applied to ferns, &c., have never been published. The *Art Journal* for 1851 contained some articles on the subject. We believe some details will also be found in the *Journal of the Society of Arts ;* and we have seen other articles some years ago, but where we do not at this moment remember. The principle of the work is different to that you have been trying. An impression of the frond of the fern is taken in some plastic material, such as softened gutta-percha, and from this an electrotype, which serves as the matrix for another electrotype, from which impressions in coloured ink are taken. Photography might be used for obtaining impressions in the way you mention, and then coloured prints might be obtained by mixing a coloured pigment with the gelatine in Swan's carbon process. You could not obtain coloured impressions with the collodio-chloride.

Engineer.—Whilst agreeing with many of your remarks, we could not insert your letter without re-opening a controversy which is now closed. Your letter would of course bring rejoinders, and so on interminably.

Clericus.—The best plan to remove silver contaminations from your gutta-percha tray will be to place a solution of iodine and iodide of potassium in it for a few hours, and then wash with a solution of cyanide of potassium, which will remove all trace of the silver adhering. Then wash thoroughly with clean water.

W. H.—Major Russell has not published any fuller details of his recent modifications in the rapid tannin process than those which have appeared in our pages. He is, we believe, preparing an appendix to his work on the tannin process, which will doubtless contain full particulars.

J. A. L.—It is very difficult to give any efficient advice in a case like yours without an actual inspection of the resources of your studio. You may shut out direct sunlight without entirely losing the light, if you employ blinds of tracing cloth or frames covered with tissue paper. Of the cards you enclose, No. 5 is best lighted ; No. 9 is also good, but requires a little more reflected light on the shadowed side.

Progressive.—A collodio-chloride print on paper may be coloured in oil, and would probably require the same kind of preparation as a print on albumenized paper. Collodio-chloride can be applied to canvas. See an article on the subject in the News for February 10th.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Watson, 68, Regent Street, Great Yarmouth,
Photograph of Child on Seashore.

Messrs. Preston and Poole, Penzance, Cornwall,
Seven Photographs of H.R.H. the Princess of Wales.

Mr. Thos. Bennett, 46, Foregate Street, Worcester,
Photograph of Rev. Alfred Deck.

Mr. G. E. Alder, Cheltenham,
Four Photographs of C. Schrieber, Esq., M.P.

Messrs. Appleton and Co., Bradford,
Two Photographs of Rev. Morley Punsbon.
Two Photographs of Rev. Richard Roberts.
One Photograph of Rev. W. Arthur.
Two Photographs of Rev. Bishop Janes.
Two Photographs of Rev. W. Shaw.
Two Photographs of Rev. S. Hardy.
Two Photographs of Rev. G. Rowe.
Four Photographs of Rev. Samuel Coley.

Mr. Fred. Downer, High Street, Watford,
Two Cartes de Visite of the Countess of Clarendon.
Two Groups of Lady Constance Stanley, Lady Emily Villiers, and Hon. George Villiers.
Two Cartes de Visite of Lady Emily Villiers.
Two Cartes de Visite of Lady Constance Stanley and Lady Emily Villiers.
Photographic Group of Lady Constance Stanley, Lady Emily Villiers, and the Hon. George Villiers, and Hon. Francis Villiers.
Photograph of Lady Emily Villiers on Horseback.
Photograph of Lady Constance Stanley, with Donkey Carriage, &c.

Mr. Peter Ewing, Kinross,
Two Photographs of Dunkeld.

Messrs. Tear and Co., Kennington,
Photograph of the only true Portrait of Our Saviour, from an Oil Painting.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 364.—*August* 25, 1865.

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NEW METHOD OF PHOTO-RELIEVO PRINTING.

A **Method** of producing, by means of the printing press, transcripts of photographic negatives with any approximation to delicacy, definition, detail, and true photographic half-tone, is a process which must interest everyone, first, by its elegance and ingenuity, and next, with its economic importance. In our last Mr. Walter Woodbury gave a succint account of the method by which he is able to effect this object, and on Saturday last we had the pleasure, in company with about a dozen gentlemen distinguished in connection with photography, art, and science, assembled for the purpose, at our private residence, of witnessing the operations. Mr. Woodbury demonstrated, as far as improvised apparatus would permit, the method of securing impressions on paper and glass, by pressure only, from an intaglio plate, obtained by the processes described, by the aid of a photographic negative.

It is not necessary here to enter into a detailed history of the process, or of its independent discovery by two gentlemen. We received the first intimation of such a discovery, in confidence, from Mr. J. W. Swan; and subsequently we learnt from Mr. Woodbury that he had been experimenting in the same direction. The latter gentleman informed us that he had obtained a patent, securing the principle in various applications; and he subsequently offered half the patent to Mr. Swan as an independent inventor, having equal moral rights as himself. By some unhappy misunderstanding this partnership of interests was not only not consummated, but the negociations, when terminated, left them with a mutual sense of injury. That part of the matter is now past, and it is not necessary to refer to it in further detail. It is somewhat curious to note, however, that whilst the idea appeared so novel and beautiful here, to everyone to whom it was mentioned, M. Gaudin, when we first described the process, nearly twelve months ago, after giving a translation of our article, declared the principle to be as old as Aaron, and stated that he had experimented in a similar direction twenty years before. But there was this distinction between his experiments and those now under our attention. His was a method of printing with translucent ink from intaglio plates, *engraved by hand.* The application of the same idea to photography, as M. Gaudin remarked, might lead to important results. It is, indeed, in the photographic idea that the whole interest centres. The beauty of the idea consists in the possibility of getting an exact transcript of a negative in gradations of relief in a metal plate, and printing from that in gradations of thickness of a translucent ink.

As we conceive the matter to be one of very great importance we will repeat a portion of our statement of the principles involved, given in October 1864, in order that our readers may have the principles upon which this mode of printing is based clearly in view.

There are five distinct modes of printing or multiplying, from a cliche, pictures or designs. *Block printing*, or the method of producing impressions by inking a block with raised surfaces, and obtaining a copy of such raised surfaces by pressure, upon paper or other fabric, as in wood engraving, &c. *Intaglio printing*, or the method of producing impressions by filling up with ink lines or hollows in a metal plate, the cleaning the surface and obtaining a copy of the lines and hollows by pressure, which causes the ink to be transferred to paper or other fabrics, as in copper-plate printing. *Lithographic printing*, or the method of producing impressions by applying ink to a design upon a stone, the design having an affinity for the ink, whilst the other portion of the surface repels the ink, the design so inked being obtained upon paper by pressure. *Photographic printing*, or the method of producing an image by the action of light through a negative, upon a surface which is darkened by the action of light. And *Carbon printing*, or the method of producing an image by the action of light through a negative, upon a soluble substance which is rendered insoluble by the action of light, and so imprisoning any colouring matter incorporated with it, and thus yielding a design in such colour.

In each of the three first-named methods, gradation of tint is obtained on the same principle; the ink applied is opaque, and the thinnest, as well as the thickest, layer of it should be black. The gradation, or variation, in depth in the image is obtained by the design being formed of lines or dots: when the lines or dots are large and very close to each other, a very deep tint is produced; when they are fine and wide apart, a light tint is produced; an absence of either lines or dots to receive the ink leaves the paper white, and a continuous surface to receive the ink produces a breadth of black. But in no case is there gradation of tint in a continuous surface, or what is termed a flat tint. In photographic printing, gradation is obtained on a different principle: lines or dots, hatching and stippling, are unnecessary. The gradation is obtained by degrees of depth in a continuous tint, like "washing," in water-colour drawing. It is the nature of this gradation, and its dissimilarity from that employed in ordinary printing, which has been the great difficulty in obtaining successful press photography.

In carbon printing, gradation is obtained without lines or dots, as in ordinary photographic printing, but the method of securing that gradation is again essentially different. It is obtained here by different thicknesses of a coloured translucent material on a white ground. The deepest blacks consist of a sufficient thickness of this material to become practically opaque, and cover the white paper upon which it is fixed, without allowing it to show through; the next depth of tint is obtained by a slighter thickness, which allows a trace of white to show through, producing the effect of deep grey; the other tints by varying thicknesses, the thinner the layer of the coloured translucent medium, the more delicate the tint of grey, as the white ground becomes more and more apparent, gradually merging into the pure white of the ground as the layers become attentuated to nothing. This mode of securing gradation embodies a new principle which has been scarcely sufficiently recognised in treating of carbon printing, and it is of the utmost importance in the process we are about to describe.

The new system of printing consists in a combination of the principle upon which intaglio or copper-plate printing is based, and that upon which the image in carbon printing is obtained. An image in which the shadows are in relief, and the whites depressed, is obtained by exposing bichromated gelatine under a suitable cliche to the action of light, and afterwards to water. The details of the process may be varied, but we need not enter into them here, as the principle is well known. From the gelatine an electrotype is obtained with the lights in relief, and the shadows depressed, as in an engraved copper-plate. This is the block or cliche from which impressions have now to be obtained by mechanical means. It must be borne in mind that the intaglio so obtained represents by degrees of depth the gradations of the image. This intaglio is now to be filled with a thick solution of gelatine, containing indian ink, or other colouring matter mixed with it; when slightly set, and the surface cleaned as in copper-plate printing, it is placed in contact with paper, the surface of which would be best prepared with gelatine, albumen, or collodion, to prevent it being absorbent; the block is then brought into firm contact by steady heavy pressure. The set gelatine and colour will be thus delievered on to the paper, much in the same way that the cook delivers a shape of jelly from its mould. The gelatine and colour so delivered on to the paper will in all respects resemble a carbon print. The deepest shadows will consist of a thick opaque layer forming blacks, each gradation from these to white consisting of a thinner layer of the translucent material.

We have said that in demonstrating on Saturday Mr. Woodbury was confined to the use of improvised apparatus and material, his press, &c., from a misunderstanding, not having come to hand. A brief description, however, of these improvised arrangements may better aid those disposed to experiment in this direction, than would an account of the working of more perfect appliances. The intaglio plates, one in copper produced by electro-deposit, and one in type metal produced by pressure, Mr. Woodbury brought with him. The electrotype mould, which was most suited for printing on paper, was in tolerably deep intaglio, the greatest depressions being about the depth of a thin card; the whole presenting somewhat the effect of an engraved copper-plate, but with less crisp or sharply cut lines. The type-metal *cliche* was much less deeply impressed, and was prepared with a view to printing on glass. In order to print, a little gelatine was just covered with water for a few hours; when the gelatine had imbibed thoroughly the water, it was melted by heat and a little of the prepared Indian ink used for carbon printing added and mixed. A little of this gelatine, kept in a fluid state by warmth, was poured on to the centre of the intaglio mould, covering about one-eighth of its surface. A piece of fine, hard photographic paper was placed on the gelatine, and a stout piece of plate-glass was then laid on the paper. In the absence of a press, a twenty-eight pound weight was then placed on the glass, and left for a minute or two to allow the gelatine to set. The pressure was then removed, and the print lifted up; the gelatine slightly set, leaving the intaglio as jelly delivers from a mould, and adhering to the paper, giving a print in varied gradations, just in proportion to the thickness of the layer of coloured gelatine. After taking a few impressions it is found desirable now and then to slightly grease the mould to ensure the print delivering perfectly without adhering or leaving any of the coloured gelatine behind. We learnt from the experiment we saw, that some samples of gelatine are not well suited to the purpose of printing. That which we had in stock had the peculiarity of setting very imperfectly, continuing for a long time fluid, and had consequently a tendency to leave the mould imperfectly. This, with the unequal and imperfect pressure, coused the results of the operation to be less satisfactory, pictorially, than other prints produced with other materials from the same mould; but they admirably illustrated the principles involved.

Although Mr. Woodbury has made considerable progress, and attained some excellent results, there is doubtless still something to learn in such a process, and still higher results to be gained. At present some uncertainties seem to exist as to the absolutely best method of obtaining the intaglio mould. Mr. Woodbury, as those of our readers who have carefully studied his communication in our pages last week know, uses a film of gelatine and bichromate of ammonia not perfectly dessicated, supported by a sheet of talc, which is in contact with the negative, the whole placed in the cone of rays formed by a large condensing lens. Whether from the intervention of the sheet of talc, or the slight divergence from parallelism of the rays passing through the negative, or from other causes yet to be noted, it appears that sometimes there is slightly less sharpness in the metal intaglio than is to be found in the negative. Mr. Swan we know attaches great importance to the advantages of adding a little colour to the gelatine in order to control the action of light, he also prefers to use a dry film, and to print by superposition. He obtains thus somewhat less relief, but he believes that more sharpness is also secured. Mr. Swan prefers the slight relief; Mr. Woodbury, who has worked out the printing details carefully, and somewhat extensively, says that good results cannot be obtained on paper with low relief, inasmuch as the inequalities of the surface of paper play an important part in spoiling an image obtained by pressure in this way when the relief is very low. Another cause at times of imperfect sharpness arises from the tendency in the gelatine mould to swell on being placed in the solution of sulphate of copper for procuring an electrotype, and thus slightly marring the crispness of the finer lines. This, as J. Trail Taylor suggested, might possibly be somewhat obviated by employing a solution of cyanide of copper, which being alkaline would act less readily on the gelatine than an acid solution, and probably improve the result. The system of obtaining an impression in a soft metal by pressure already gives sharper results than the electrotype, and it may possibly be found with improved appliances to give perfect results.

As we have already stated, a considerable degree of excellence has even now in the infancy of the process been obtained, and we are very sanguine that results will shortly be secured which will give the process an immediate practical economic value wherever large numbers are required. Mr. Woodbury thinks that with three or four presses going, which could easily be worked by one person, the prints could be produced at the rate of about one hundred and twenty per hour. It will be readily seen that in this respect this method might compete without much disadvantage with copper-plate printing. If, instead of merely using an ordinary water colour in combination with the gelatine, a vitreous colour were employed, we have a ready means of producing a print in enamel colour which, transferred to glass or China vessels, might be burnt in without difficulty. Other pictorial and decorative applications will readily suggest themselves as the process comes into use, increasing its value and interest. We may here remark that many of our readers will have an opportunity of forming some notion of the present progress, by examining the transparencies on opal glass which Mr. Woodbury now exhibits at the North London Exhibition, as well as the intaglio in electrotype and type metal with prints therefrom, also shown at the Agricultural Hall.

Another application of the same principle, and that to which we believe Mr. Woodbury, at the outset of his experiments, attached the most importance, is the production of transparencies in porcelain, the image being produced by the various degrees of relief, and, consequently, in semi-transparent material, in degrees of transparency or opacity. From the intaglio moulds already described it will be seen, such images in porcelain could be easily produced. In a conversation, a day or two ago, with Mr. Adams, of the firm of Edwards & Son, of Dalehall Potteries, we learn that the production of such transparencies is an important branch of their manufactures, a large market for such articles being found on the continent. At present an important item in the cost is the employment of skilled artists in preparing the moulds by hand labour. The employment of a photographic operation, such as we have described, would enormously decrease this cost, and would necessarily confer increased value in the beauty and detail, as well as in the interest attaching to the results.

THE ACTION OF LIGHT ON IODIDE OF SILVER.

M. Poitevin, in the last number of the *Moniteur de la Photographie*, referring to the recently-published researches of Dr. Vogel as to the action of various sensitizing agents in facilitating the reduction of iodide of silver by light, says:—

"I have seen the summary of the recent labours of Dr. Vogel on the sensitizers of iodide of silver, and the conclusions he has drawn from them:—'The bodies which readily absorb free iodine, and chemically combine with it, act as sensitizers upon iodide of silver, that is, they determine its reduction in the light.'

"I must remark that, in 1862, in my *Traité de l'Impression photographique san Sels d'Argent*, at Chap. X. p. 129, *des effets chimiques de la lumière*, I said—'For light to reduce a body it must be in contact with, or mixed with, another able to absorb the lost element, and form a more stable compound in the light than the first.' I again insist upon this point in p. 131 of the same chapter.

"I do not imagine that Dr. Vogel is ignorant of the contents of my work of 1862. However that may be, perhaps he has taken as the starting point of his researches the note I communicated, on the 6th of November, 1863, to the Photographic Society, which is inserted in its bulletin, page 305, and sequel. I say that the action of light is *nil* upon chemically pure iodide of silver, isolated from every substance which can retain the iodine it tends to separate. The consequence of this statement is very evident, the more so since it is found in my previous publications.

"The note that I communicated was only an extract from one more complete, which I considered it useless to read before the Society, because it merely contained the same opinions as appeared in my work, published in 1862; and because I merely wished to draw attention to the empirical employment of tannin by Major Russell; inasmuch as he regarded it in the light of a *preserver* only, while I had ascertained and explained the part really played by tannin in the photographic process.

"I claim, therefore, as previously made known by myself, the results at which Dr. Vogel has now arrived, whose labours on this subject are otherwise full of merit, as they are directed to the search for the various bodies which permit of the action of light upon the haloid salts of silver, and upon the iodide in particular."

It is somewhat singular that such a striking identity should exist, not only between the views of M. Poitevin and Dr. Vogel, but in the statement of them; since the high character of the latter gentleman does not for a moment permit the thought of unacknowledged borrowing. It is not a little odd, also, that this important statement as to the mode in which nitrate of silver and other sensitizers act in connection with iodide of silver, should occur incidentally in a work on producing photographic impressions without salts of silver; and Dr. Vogel might well be excused for overlooking the existence of the passage.

The paper read before the French Society, in December 1863, will be found on p. 579 of the Photographic News, Vol. vii., and contains the statement of M. Poitevin's discovery that tannin was really a sensitizer, and not simply a preservative varnish acting mechanically. Dr. Vogel's recent researches not only point to the existence of many substances which act similarly, but also elucidate still more clearly the nature of their action. It is somewhat singular that M. Poitevin's statement, in the article in question, of the possibility of working in daylight until the final application of a coating of tannin, has, by recent writers on the subject, no doubt quite innocently, been frequently overlooked or ignored, whilst, in some quarters, his discovery of the photo-carbon printing has been persistently denied. It is thus, at times, that the scientific benefactors of mankind are rewarded.

PHOTOGRAPHY AT THE DUBLIN INTERNATIONAL EXHIBITION.

[Fourth Notice.]

The display of landscape photography in the Dublin Exhibition is very good, and our interest in examining it was not lessened by the fact that many of the contributions were very old friends, although this cause renders it the less necessary that we should notice many of them in extended detail.

Amongst the old friends to which we have referred, are the contributions of Mr. Bedford, of which we scarcely know which most to admire, his charming English landscapes, or grand eastern views, both kinds of pictures so perfect in photography, so good in art, so brilliant, so soft and full of tone, with such admirably managed skies, so well printed, mounted and framed with such neatness and good taste. The admirable Swiss views of England, so full of quiet harmony, so free from the hardness which many photographers of similar scenery mistake for brilliancy. The wonderfully brilliant and exquisitely delicate landscapes of Heath, including the finest photograph of Windsor Castle we have ever seen. The prints of Mudd, from dry plates, some of immense size, and at once brilliant without hardness, and soft without tameness, and his cabinet prints which have probably never been surpassed in either artistic or photographic qualities by photographs produced by any process whatever. The poetic landscapes of Dixon Piper, of which we have not seen any exhibited for some years. The bold and picturesque Pyrannean views of Gillis. The charming landscapes of Annan, alike excellent for their perfect manipulation, and the fine feeling which pervades all his work. The unsurpassed reproductions of Thurston Thompson, and the grand landscapes of Maxwell Lyte, which we have so often admired are amongst the pictures which we are glad to see here again. The bright delicate and picturesque cabinet pictures of Rouch, which we noticed at Conduit-street; and the very admirable Irish landscapes of Brownrigg, some of which have never been surpassed, which we noticed at the same exhibition. These and some others challenge us with the familiarity of old friends, or, in some instances, as friends we had already, even if recently, greeted in Conduit-street.

Amongst the pictures with which we were not so familiar, we may mention as claiming a prominent position the very admirable landscapes of Sir Joscelyn Coghill, to whose indefatigable energy and patient courtesy much of the success of the photographic department was due. These are amongst the few Irish landscapes to which photography, as represented by this Exhibition, seems to have done justice; bright, delicate, and picturesque, they are altogether excellent. Amongst some of the finest pictures which were new to us, were a series exhibited by the Manchester Photographic Society in its corporate capacity. There is in this method of contribution the illustration of an *esprit de corps*, which is very admirable, inasmuch as this being the only entry in the catalogue, the individual credit of each contributor is very apt to be merged in that of the general body. The exquisite character of many of these pictures induced us however to examine them more carefully, and find the names of various contributors, Amongst these we may especially mention the stereoscopic and cabinet pictures of Mr. Underwood by the collodio-albumen process, possessing every quality of delicacy, force, and atmosphere which could be hoped for in the best pictures by the wet process, and a pictorial excellence very rarely attained. Mr. Mabley's pictures by the same process vindicate its capabilities equally well; his view of Conway, and another of Bettws-y-Coed are equal to anything in the Exhibition. Of Mr. Wardley's pictures by the same process, we cannot speak more highly than to say that they are not distinguishable in most respects in excellence from Mr. Mudd's, possessing the same delicacy and brilliancy, and much of the same pictorial feeling. Mr. Penny of Cheltenham, and Mr. Baynham Jones of the same city, both exhibit very excellent examples of the results obtainable by the tannin malt process, and better still, the pictures of both display fine taste and artistic feeling. Mr. Frank Good exhibits a number of exceedingly fine landscapes, which point to him as one of the most promising of the rising landscape photographers.

There are many excellent contributions to instantaneous photography. The excellent Italian instantaneous views of Col. Stuart Wortley lose nothing from being printed by the Wothlytype process, they are admirable examples of the qualities which that process can render. Mr. Blanchard's stereoscopic studies illustrate varied forms of wondrous beauty in sea, and sky, and cloud, and atmosphere, and marine incident; and also show of the power of photography to seize the bustling aspect of the crowded streets, arresting the whirl of the wheel, the foot-fall of the pedestrian, and giving an abiding existence to the events of a single moment, which in the entirety and combination could never be recalled. Of the rare beauties of Mr. Breese's transparencies from instantaneous negatives we have before spoken. Amongst the unusually good examples of instantaneous work were some very poetic landscapes with marvellous clouds and atmospheric effects, by M. Roussett, of Paris, of whose works we hope to see more examples. Captain Halford has some exceedingly perfect instantaneous stereoscopic views of charming subjects, as well as some admirable stereoscopic interiors.

We have not space for detailed notice of all the landscapes here; but may mention briefly some others which are worthy of notice. Lieut. Col. Verschoyle exhibits some interesting views of the Alhambra, printed by the Wothlytype process, which are good in many respects, but show some irregularity in toning, the same print being too blue and too red in patches. Viscountess Joscelyn exhibits some charming groups and landscapes full of graceful feeling. Johnson and Co. of Leamington, exhibit some small views with fine sky, and atmospheric rendering. F. Mares exhibits a large number of Stereographs of Irish scenery which are, however, somewhat black and heavy, and fail to do justice to the beautiful landscapes which abound in the sister isle. Ireland has yet to be done in the stereoscope, and will well repay the first competent photographer who sets about the work properly. Mr. Collis exhibits some of Mr. Clifford's photographs, taken in Spain. The Countess of Ross, and the Rev. T. M. Raven, both exhibit excellent pictures, said to be waxed paper and collodion; we presume that the landscape negative is in each instance collodion, and the sky, with some fine clouds, from a waxed paper negative. Mr. Griggs, of the Indian museum, exhibits some capital copies of Indian photographs. The Pantascopic Company have some very excellent panoramic photographs. We can simply add the names of a few others whose landscape photographs are worthy attention, and amongst these we may include some well known names. Russell Sedgefield; the Earl of Caithness; W. H. Warner: J. H. Morgan, of Bristol; Sir T. M. Wilson; E. J. Lowe, of Beeston Observatory; Hon. L. Wingfield; F. E. Currie, Lismore Castle; Dr. Hemphill; H. Haines; W. McComus; F. Beasley; F. Frith; A. H. Wardlow; J. Bull; Sig. Vialardi, and some others, all of whose works will repay examination.

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Jottings for 1865.—No. 6.

BY A PHOTOGRAPHER'S ASSISTANT.

REMARKS ON THE LATENT IMAGE FORMED IN THE CAMERA.

Among the many perplexing questions that relate to causes in photographic phenomena the one bearing on the principles involved in the production of the latent image has excited the largest share of attention. To solve this difficult problem, men of eminence, highly qualified to undertake the task, have devoted much time and careful research in seeking out the mystery; in the pursuit of which, the English, French, Germans, and Americans have engaged in friendly rivalry, each adding a valuable addition to the stock of information, each forging an additional link to the chain of circumstantial evidence that supports or disproves contending theories.

We apply the term circumstantial because direct proof (where chemical principles operate in secrecy beyond the reach of analysis) we cannot hope to produce. Nothing, therefore, remains but to follow up the object pursued by a train of inductive reasoning, based on experiment and continued observation, drawing conclusions from visible facts, and founding theories on well-considered arguments; thus step by step knowledge is increased, old theories give place to others that have received more mature consideration, and ultimately the coveted goal is approached as near as it is possible for finite minds to reach it.

The majority of investigators who have endeavoured to solve the latent image problem appear to be in favour of what is known as the "physical theory;" in other words, they have arrived at the conclusion that a latent image owes its existence to a derangement or modified distribution of atoms, caused by their exposure to actinic influence.

In order that the above proposition might be better understood, we offer a familiar example. Suppose A B and C in close contact; allow these letters to represent atoms of iodide of silver. Now let C overlap B and B, follow suite by overlapping A; it will at once be perceived that the changes effected have not altered their character, the difference made being simply in their positions. In like manner the "physical theory" teaches that iodide of silver, although experiencing a change in its molecular arrangement by the action of light as iodide of silver, it exists still: and in support of this theory, that intelligent, indefatigable, and always liberal experimentalist, Mr. Carey Lea, has lately advanced arguments which are regarded by him as convincing proofs.

Quoting from a paper written by the above-named gentleman, and reproduced in a recent number of the News, we extract the following lines:—"I hold that the production of a developable image in the camera upon an iodo-bromized film is a purely physical phenomenon, that no decomposition of the silver salts takes place, no separation of iodine." The paragraph is wound up by an expression of opinion such as we ourselves endorse, viz., "the image is entirely formed at the expense (which, we presume, means by the reducing power exercised) by the developer." He goes on then to describe a series of experiments, undertaken to prove or disprove his preconceived views of the matter; but before making further allusion to the proofs produced, we proceed to offer arguments that to our mind appear to support a contending theory, viz., that of chemical decomposition, or the partial separation of iodine from silver, when together these bodies are exposed to the magnetic action of light.

To believe in the physical theory is to consider that a change effected in the molecular structure is not accompanied by any loss or gain of material; the elementary partnership still existing under a modified arrangement of particles, but in all other respects holding the same relationship, the signature of each atom being Ag I as before. Now we incline firmly to the belief that such a signature applied subsequent to exposure of the atoms to light, is to all intents and purposes a misnomer. We believe that the analogy which exists between the chloride and iodide of silver extends to light-produced reduction. We adhere to the opinion that exposure to light, in the presence of free nitrate, causes a separation that reduces the iodide of silver, not to a metallic form, but to a sub-iodide of the metal; that in the case of an image being formed, a partial separation of iodine has been effected, thenumber of atoms acted on being in proportion to the intensity of light admitted to work out the several gradations of tones; but every atom that has been exposed to the acltinic ray, has liberated a portion of iodine, leaving a sub instead of a perfect salt; the partial decomposition thus produced doubtless, imparting a new property that materially affects the reduction of free nitrate when acted upon by the developing agent. We regard this sub-iodide as the invisible foundation, the free silver as forming that which is visible in the superstructure; and in support of these views we call attention to the fact, that a collodionized plate made sensitive and exposed, is restored to its normal condition by immersion in an aqueous iodide solution. This to our mind affords sufficient evidence to disprove the physical theory, for according to the generally accepted doctrine of atomic arrangements, the union of elements is governed by unchangeable laws that impose limits to combination, and if a compound body assumes its highest form, no further supply can it accept; the question therefore arises, if the change that occurs in producing the latent image is physical, by what process of reasoning can we account for the phenomenon produced by the iodide bath? Accept the chemical theory, and the mystery is at once explained. The sub-iodide still retains its appetite, and is ready to renew its original form when iodine is again supplied; when this takes place recomposition occurs, and iodide of silver in all its integrity is restored. Again exposed to light, decomposition takes place as before, but should development follow, free nitrate must be supplied, the visible image being formed by the silver reduced by the developer, whilst the foundation by which it rests is probably swept away by the fixing agent.

This view of the subject at first sight would appear entirely disproved by the experiments recorded by M. Carey Lea, for that gentleman succeeded in removing entirely the picture, leaving a smooth and even film without a vestage of evidence to show that the iodide had been acted on at all, save that produced by a subsequent experiment that proved it capable of renewing the image a second time on applying a fresh supply of silver for development; but on further consideration it will be perceived that the experiments alluded to tend to confirm the correctness of the chemical theory. The partial decomposition of the iodide salt does not necessitate a change of colour or density; notwithstanding the alteration that occurs in its chemical properties, it might form a foundation and still remain intact, after the superstructure has been dissolved by the reagent present to it its full supply of iodine, and we believe no image will follow if an attempt is made to renew the structure. The sub-iodide might exercise an attractive influence and yet enter into nothing more than a cohesive companionship that is separated when the base is swept off by the fixing solution; in a word, all the phenomona recorded by M. Carey Lea might be put into action, but we cannot see, they contradict in one point the theory of decomposition; on the contrary, all the proofs produced can only be recognised as supporting the chemical theory, which we believe to be the most rational and conclusive. To attempt a defence in favour of the physical theory is to envelope ourselves in a labyrinth of perplexity. To advocate opposite views seems to us an easy task; we, therefore, record our arguments free from the spirit of dogmatism. It is possible we may be wrong; still, we candidly avow our opinions, trusting that should it do nothing more than excite attention to the subject, it will be admitted that the present paper has not been written in vain. In our next we purpose entering into a friendly criticism of articles that have recently appeared relating to chloride of gold and toning solutions.

A JOURNEY IN SEARCH OF FOOD FOR THE CAMERA.

BY A LAZY CONTRIBUTOR.[*]

The "High Street"[†] of most country towns may generally be at once picked out from its neighbours adjacent by its narrow irregular pavement, contrast of style observable in the buildings, and the equally painful irregularity of the distance which separates them from their neighbours opposite. The High Street of Southampton however, is an honourable exception to the general rule, made and provided for the building of country streets, and is really a very fine street, being broad, well paved, and lined on each side with shops which in style compete honourably with their brethren in London, and whilst the contrast of style in the architecture is more marked than agreeable, there is in many parts a grandness and picturesqueness that is very effective, giving the town a distinctive character most pleasing to the eye of anyone fresh from modern Babylon.

The town was by no means dull either, for there was plenty of life and bustle, but so different from London: a photographer working rapidly could make, with but little trouble, several very effective pictures, for there is the Bar gate, a very fine specimen of the architecture of feudal times, also the Hartley Institute, a most imposing building to be done. I had not time, however, to look out for much material for the camera, for evening was fast approaching, and I had yet to get across the Solent. In a short time I was on the pier waiting for the steamboat, and from it witnessed one of the most perfect pictures I had seen for a long time. It would possibly have been overlooked by many amateurs for there were but five materials to make the picture. Only a foreground of irregular moss-covered, and tide stained stakes, a winding muddy shore, and the tide sluggishly receding from it, a few boats, some afloat, whilst one that had evidently made acquaintance with grief was on its side, and imbedded in the soft mud. Not much truly to make a picture. But it was near sunset, and that made all the difference, for Sol seemed anxious to leave nothing but favourable impressions behind him. He was at this moment obscured by some morose angry-looking clouds, but even their edges were brightened by his irresistible cheering influence, and became absolutely beautiful in consequence. But far away in the water his gladdening influence was undisturbed, and the grateful waves danced in long ripples of gold, and even the mud became perfectly beautiful, for, from the edge of the water straight upwards, to the eye it was a bar of frosted gold, and then disturbed by the black frown of the cloud, it slowly subsided into sober grey. Brightness cannot long be resisted, and the cloud gives up the struggle and slowly retreats, and is rewarded with a parting smile which at once removes all gloom and bestows instead every bright colour on Nature's exhaustless palette. Anon, satisfied with the work of the day, the sun dips down behind the distant smooth-topped hills, and all the blaze of glory dies out and gloom creeps over all.

For the first time since I started, I regretted that my camera was an invalid at home; but I had no time to think long about it, for the noisy bell informed me that if I desired to reach the Isle of Wight I must get on board quickly. I shall not readily forget the ride down the Southampton Water in the gradually increasing gloom of night, nor how beautiful the Netley Hospital looked with its hundred lights apparently dancing in the night air, and the reflections like excentric bars of fire a mile long, nor must I talk of the mysterious influences of moonlight at sea, for description won't do, it must be felt. One hour's ride and we are nearing Cowes. Its lights have long been dancing ahead of us, but on getting very near it is funny how steadily the impression gets hold of one that the lights are rapidly advancing towards the ship. As we near the pier we seem to be threading our way amongst myriads of sea gloworms, and we do it carefully for fear of hurting them. It is within a few days of the annual regatta and the lights proceed from the fleet of yachts safely moored, and calmly awaiting the race. We are soon ashore, and in comfortable quarters, almost built upon the sea, for it washes up to the base of the room in which we take our supper with a relish, which is decidedly increased by the flavour of the haloid salts which impregnates the air, and indeed everything that surrounds us.

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[*] Continued from p. 389.

[†] We have often been puzzled to know why this word "high" was such a favourite one for their streets, with those most respectable folkes our forefathers, and as we have never heard a satisfactory reason given for the employment of the word, we would ask, is it that the *ne plus ultra* of counterdom is to be generally found in streets so named, and that that exalted personage the mayor is very frequently chosen from the well-to-do persons there congregated.

Next morning we start for Newport by train, and are struck by the fact that the island is small, for we are there in a quarter of an hour. During this short ride, however, we see enough of the Medina river by whose side we travel most of the way, to satisfy us that plenty of picturesque spots are to be found near its banks.

Newport is an apparently well-to-do town, but sluggish notwithstanding. Its situation is delightful, for it is hemmed in nearly all round by hills. The new church is one of the first specimens of modern gothic in the kingdom. It has a magnificent spire, and has a great number of original points. The effect of light and shade is faultless. Unfortunately, however, it is so shut in by surrounding buildings that it appears almost impossible to get a satisfactory view of it. In this church is to be found a beautiful and touching monument to a daughter of Charles I., placed there by the present Royal family. Carisbrooke Castle is only a mile distant, and we take an unfrequented lane in preference to the main road for it apparently points in the direction of the hills. The distance was insignificant, but the labour immense, for of all the contrivances to torture the feet of patient pilgrims commend me to that road. Along its entire length the lane was strewn or rather systematically paved with flints, with the sharp side uppermost. I can say it now that the torture is past, that all I endured was fully made up in the extra pleasure I experienced when I reached the top of the hill, for one of the most beautiful pastoral views to be found in Europe is to be seen from the top of this hill. I have not been all over Europe, and therefore I say it the more unhesitatingly. On the one side is the town of Newport, quietly nestled down and looking so cosy and comfortable in the valley, and beyond it the Medina picking its way carefully out to sea. On a hilly prominence near its mouth stand out the towers of Osborne House from a mass of dense foliage, which extends down to the edge of the sea. The river opens out into a very little bay, dotted all over with minute craft apparently not big enough to carry Tom Thumb. Miles beyond, the flat line of the English coast can be made out, and beyond that again, further inland, the chalk ridges of the Portsdown hills. Immediately below us, on another side, is the very small village of Carisbrooke, and on a very small hillock, the very pretty old church. Just above us is the cemetery, and nearly on our level, but a little below us, is the well worn old Castle of Carisbrooke, with its Roman earthworks and its more modern Norman remains.

(*To be continued.*)

NEW COMBINATIONS OF SULPHOCYANIDE OF GOLD.

BY M. T. CLEVE.

When we add a solution of chloride of gold neutralized by bicarbonate of potassa to a solution of sulphocyanide of potassium in excess, we obtain a voluminous orange-coloured precipitate which, washed in cold water and dried in vacuo, is composed of

$$\mathrm{Au\ (C^2NS^2)^3+K,\ C^2\ NS^2}$$

If we heat the mixed solutions, the orange precipitate is dissolved, and upon cooling is deposited in the form of fine orange-coloured needles, having the same composition as the precipitate. In this last operation a portion of the combination is decomposed, and remains in solution upon the evaporation of the filtered liquor. Sulpho-hydrocyanic acid is disengaged, gold is deposited, and finally we obtain a crystallization of chloride of potassium and auro-sulphocyanide of potassium :—

$$\mathrm{Au\ \ C^2\,NS^2+K\ C^2\,NS^2}$$

The per-auro-sulphocyanide

$$\mathrm{Au\ (C^2\,NS^2)^3+K,\ C^2\,NS^2}$$

is decomposable by water, even when cold. It dissolves in alcohol and in ether, and is deposited from them in the form of needles. These solutions are acid. Above 212° the salt blackens, gives off sulphur and fetid gases, gold, and sulphocyanide of potassium.

Its alcoholic solution presents the following characteristics :—

Weak hydrochloric acid causes copper-red needles to appear after the lapse of some time. Soda deprives it of colour, and in time turns it yellow, then green, and deposits a blackish blue powder. Ammonia produces white needles after decolouring the liquor. Ferric chloride colours it blood red. Other metallic solutions all produce very dark precipitates.

Auro-Sulphocyanide of Potassium, $\mathrm{KC^2\ NS^2+Au\ C^2\ NS^2}$.—This product is obtained by the decomposition of the preceding compound as shown above, or by the direct addition of neutral chloride of gold to a solution of sulphocyanide of potassium heated to 212°, the yellow solution is evaporated to crystallization in a water bath ; it is purified by crystallization in absolute alcohol, from which the substance is deposited in fine needles. These crystals are very soluble in water, fusible and decomposed at 212°. Hydrochloric acid does not precipitate the aqueous solution of this salt ; ammonia produces a precipitate soluble in an excess of the reagent ; chloride of iron gives a white precipitate, while the liquor assumes a red colour. The other metallic solutions also produce precipitates. The precipitate obtained by nitrate of silver is insoluble in water, but soluble in ammonia ; its composition is $\mathrm{Ag\ C^2\ NS^2+\ Au,C^2\ NS^2}$.

Experiments made to prepare an auro-sulpho-hydrocyanic acid by the decomposition of the potassic salt under the influence of hydro-fluo-silicic acid have remained indecisive. The precipitate obtained by ammonia in a solution of auro-sulphocyanide of potassium, and which is crystalline under the microscope, has a composition of $\mathrm{AuC_2\ NS^2+NH^3}$; it decomposes little by little, and blackens ; heated with water it loses some ammonia and leaves a green powder. Acids decompose it. It must probably be considered as a combination of an *auramine* with sulpho-hydrocyanic acid

$$\left.\begin{matrix}\mathrm{Au}\\ \mathrm{H}\end{matrix}\right\}\mathrm{N,\ H,\ C^2\ NS^2}$$

Nitrate of silver produces a precipitate of sulphocyanide of silver.—*Journal für Praktische Chemie.*

ON THE PREPARATION OF THE NITRATE OF SILVER BATH FOR COLLODION.

BY DR. E. FOURNIER.

In MM. Barreswil and Davanne's *Chimie Photographique*, pages 107 and 108, we read :—"We prefer fused nitrate of silver, which permits our having a perfectly neutral bath (*even turning reddened litmus paper blue, which is necessary to give to the collodion all its sensibility*)." M. Monckhoven, in his treatise, says that the nitrate bath must be perfectly neutral. M. l'Abbé Laborde, in the *Revue Photographique* for October, 1861, says :—"It is now recognised that to obtain a picture, the sensitive film must necessarily present itself to the developer with a *tendency to acidity*, a tendency which it will have derived from the silver bath, or from the free iodide in the collodion. This acidity may be so feeble as to escape chemical tests, and yet suffice to secure the purity of the whites with the maximum of sensibility."

M. Gaudin expresses his views in the following manner:—"The silver bath also *must be acid*, especially when employing iron developers. I have found it almost impossible to obtain a passable picture with a bath neutral to litmus paper; but upon adding one or two drops of nitric acid, sufficient to redden the test paper, the operation proceeded favourably, and still better with a collodion containing acetic acid."

In presence of opinions so divergent, emitted by persons whose scientific and artistic merits no one will question, what conclusion must we come to? That it is impossible that these four opinions, notwithstanding their authority, can be correct, and that there must exist in this chemical fact a source of error not yet elucidated.

And in examining the various photographic publications, we recognise that the authors are all specially occupied with collodion. How much has been written upon "instantaneous collodion," permanent collodion, &c.!

These researches, it must be admitted, have all borne fruit, and we may say that at the present time it is not difficult to prepare a collodion that "works well." But can we say as much for the nitrate of silver bath? Certainly not; and I fully share the opinion of certain eminent operators who think that the greater part of the failures in the collodion process depend on the want of precision in the methods given for preparing the silver bath.

I shall now attempt to supply this deficiency.

If we fuse pure nitrate of silver, and heat it for a moment above its fusing point, we obtain a deep grey fused nitrate of silver; that is to say, a portion of the nitrate has been reduced, and what remains in the capsule is a mixture of nitrate and oxide of silver.

A solution of 6 to 7 per 100 of this salt gives, with a good neutral collodion and an iron developer, proofs completely black, without the slightest trace of a picture. The bath turns reddened litmus paper blue.[*]

To show how completely innocent the collodion is in this failure, we have only to take another proof with the same baths, but taking care to well wash the glass plate with distilled water after its immersion in the nitrate bath. The proof, after exposure, treated with sulphate of iron and a solution of nitrate, acidulated with acetic acid, 3 per cent. of each, will give a good picture. It is therefore evident that the presence of nitrate alone upon the plate prevents the proof from appearing. Now, if to this same bath of nitrate of silver we add every day two drops of a solution of—

Water	100 parts
Nitric acid...	10 „

we shall observe the following (in each experiment the acidulated water must be left in contact with the bath at least twelve hours):—The plate under the iron developer, after each exposure, will become less and less black; it will take a reddish tint, allowing the picture to become visible, and becoming gradually stronger; reddened litmus paper will no longer turn blue in the nitrate bath; and, lastly, after several experiments, we shall see the picture come out distinctly, the whites remaining pure, and, as the phrase goes, *the collodion being very sensitive.*

In this state of things, litmus paper is insensitive in the silver bath.

If we continue adding acidulated water to the bath, we shall see that day by day the plate becomes less sensitive; next, only the strongest lights make their appearance; blue litmus paper reddens more and more in the bath, and at length a moment arrives when, by the successive addition, day by day, of two drops of acidulated water, we no longer obtain a proof with the same collodion and the same iron developer, and blue litmus turns quite red in the silver bath.

Now in this series of experiments, effected in twenty days upon twenty plates, we can see at a glance, by placing the proofs in a row, and viewing them as transparencies, the gradual and various influences upon the aspect of the pictures of a silver bath at first basic, then nearly neutral, and finally acid.

We may therefore conclude (which I do not pretend to give as a novelty) that nitrate baths containing oxide of silver in solution completely fog the proofs, and that very acid baths prevent all luminous impression.

Between these two extreme points there exists a state of the nitrate bath which, containing neither oxide nor acid, will promptly give sharp and clean pictures. This is what we term the neutral state of the nitrate bath.

But litmus paper is powerless to show an acid or basic state near a state of neutrality; as well observed by M. L'Abbé Laborde, the action of the nitrate of silver completely masks the reaction on the paper; we must, therefore, give up this test. In the second place, whatever precautions may be taken in preparing the nitrate of silver, it is, I believe, rash to assert that it will be photographically neutral after it is made.

A bath which has no effect upon litmus paper will cause carbonic acid to be liberated from a solution of carbonate of soda added to it. The chemical proof is, in this case, I believe, indisputable. We must therefore feel our way in gradually acidifying an alkaline bath, and in chemistry this is an imperfect method. We may arrive at it nearly; but we shall never, by these means, succeed in obtaining a chemically neutral bath.

Moreover, a silver bath always tends to become acid by use, because there is almost always a little free iodine in the collodion.

To operate with certainty in the preparation of a silver bath, we must satisfy the two following conditions:—1. Prepare a bath with excess of nitric acid, in order to be sure of the complete absence of oxide of silver in the solution: blue litmus paper must redden in this bath. 2. Afterwards treat the solution by a substance which removes all the acid from it, with the certainty that it will not render it basic. It is necessary that the new substance introduced into the bath be insoluble (a silver bath can never be too pure); and, lastly, that the salt formed, if it be soluble, in no respect disturbs the photographic phenomenon.

I believe that carbonate of cadmium fulfils all these conditions absolutely.

The following is the method I propose for preparing the silver bath:—If the nitrate of silver we possess be basic, we add to the bath two or three drops of a solution of—

Distilled water	90 parts.
Nitric acid	10 „

until we obtain an acid bath. We cannot satisfy ourselves of the acidity of the bath by litmus paper until twelve hours after the addition of the drops of acidulated water.

If the paper does not redden a little, two drops more of acidulated water must be added, and then put aside until the morrow. When the effect is obtained, we put into the bottle containing the bath a small quantity of carbonate of cadmium; a slight effervescence takes place, due to the disengagement of carbonic acid, and the non-decomposed carbonate of cadmium is precipitated to the bottom of the bottle, in consequence of its insolubility. A little nitrate of cadmium is formed, which is dissolved in the bath, and the liquid is chemically neutral.

The liquid must be carefully filtered every time it is used. The carbonate of cadmium in excess prevents all acidity

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[*] All my experiments have been made with a neutral collodion, composed as follows:—

Ether	80 drachms
Alcohol	40 „
Gun cotton	1 „
Iodide of cadmium	1 „

Iron developer, freshly made:—

Water	100 parts
Protosulphate of iron	4 „
Glacial acetic acid	4 „

by afterwards combining with the nitric acid, which the iodine in the collodion may set at liberty.

Carbonate of cadmium is a very stable product; it is unacted upon both by light and moisture. It is also easily prepared, and I believe is to be preferred to any other carbonate in this case. In fine, to prepare a chemically neutral silver bath, we must first obtain it acid, and then neutralise it by a carbonate; the carbonate which best fulfils the required conditions is the carbonate of cadmium.

Note, by M. Gaudin.—M. Fournier's reasoning appears to me quite sound. He conceives that the acidity of the silver bath must be reduced to a minimum by the addition of a small quantity of carbonate; but it seems to me that it is immaterial which carbonate, only there is one which exists in a compact form, which may fulfil this office without leaving any foreign particles floating in the bath; this substance is *marble;* so that a small slab of any kind of marble placed in the bath will serve also to prevent the glass touching the bottom, and seems to me to be the best thing to accomplish the object M. Fournier has in view.—*La Lumiere.*

[It will be noted that in these experiments a simply iodized collodion is employed. If a collodion containing bromide as well be used, a moderate amount of nitric acid will not cause insensitiveness.—Ed. Photographic News.]

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ON GLASS TRANSPARENCIES.

BY G. WARDLEY.*

The printing of glass transparencies for the stereoscope and lantern by contact is a very interesting and pleasant occupation for the long and tedious winter evenings, when it would be utterly useless to attempt anything else in connection with our beautiful and fascinating art.

During the last two winters I have been endeavouring to simplify and reduce to more certainty the mode of producing these exquisite pictures, which are so much admired.

The camera and wet collodion process recently brought before you by Mr. Sidebotham yields excellent results. For exhibition in the lantern they are perfect for the purpose, equal, if not superior to the best continental pictures upon pure albumen.

The albumen process stands unrivalled for stereoscopic pictures; but I am in doubt whether we know as much about their production as our continental brethren.

Soon after the introduction of the Taupenot process, a question arose as to what part the collodion and its iodide of silver played. Some operators even asserted that the latter was useless, and that uniodised collodion would answer equally well. Others contended that the iodide of silver was necessary, if sensitiveness were a desideratum. The result of this discussion has produced a modification of the Taupenot process, now almost forgotten, except by the oldest photographers; being much slower than the complete process entirely unfits it for camera work, but it is admirably adapted for transparent slides.

The only difference between this modified and the original process consists in not sensitizing the collodion film in the first preparation. Instead of the silver bath water is used to wash away the ether and alcohol. This washing also carries away the iodizer from the collodion, so that there is nothing left upon the plate but *plain collodion*, which requires to be covered with iodized albumen and then dried. These plates are made sensitive in the acid silver bath, and washed in the usual way.

Plates prepared as above are very transparent, in consequence of there being *no* iodide of silver combined with the collodion, and very little with the albumen. This transparency of film enables the development to be judged of with the greatest certainty.

The development of these plates has generally been effected by means of gallic and pyrogallic acids combined;* but a much better mode is to use plain pyrogallic solution (without any acid). This will develop a very thin pink image, which can be intensified quickly to any degree, from brown to green, by means of the usual acid and silver solution, acetic acid giving the brown tones, citric the greens. Intermediate colours can be worked out by a judicious use of the two.

I now have occasion to speak of the tannin process, which in my hands has not been so constant and successful as I could wish, halation, or blurring the image, being its most serious defects. The colour of these pictures is somewhat uncertain, and rarely under control. Different strength of negatives and variable exposures contribute materially to influence the tone of resulting pictures. A little honey mixed with the tannin preservative is a decided improvement, if a thin substratum of albumen be used underneath the collodion. This latter addition (the albumen) makes the collodion adhere very tightly to the glass during all the necessary operations.

The preliminary coating of albumen speedily spoils the ordinary negative silver bath, causing it to give foggy pictures after a very few plates have been immersed. This fogging can be entirely overcome by substituting for the negative bath the aceto-nitrate solution: that used for the Taupenot process answers very well if carefully filtered. It can be used many times without refiltering or returning it to the kaolin for purification.

This mode of working the tannin process for transparencies served me for a length of time; but, notwithstanding all my care, prints would sometimes be produced that were useless, in consequence of halation, or from the colour being unsatisfactory, especially if printing from a strong negative.

I will now refer briefly to my last experiments in printing transparencies.

A word about collodion. For this purpose a mixture of the bromo-iodized and simply iodized yield better results than either of the two separately. If the film of iodide be somewhat pale, add to the collodion a few drops of a strong alcoholic solution of iodide of cadmium, care being exercised not to add too much, or the iodide of silver would scale off in the nitrate.

The substratum of albumen need not be used; but, instead of this, a solution of india-rubber in benzole must be used on the edges of the plate only.

The plate, being coated with collodion in the usual way, is immersed in the aceto nitrate bath, then wash well with water under a tap; drain a little, and it is ready for the preservative. Plates prepared with tannin and honey yield very brown tones if developed with acetic acid combined with pyrogallic acid; but if a little raspberry syrup be substituted for the honey, the colour of the resulting picture will be a pure black. A knowledge of these two facts enables us to use these two ingredients (honey and raspberry syrup) combined with tannin in certain proportions, so as to produce any colour, from brown to black.

It is a good plan to make two preservative solutions, composed as follows:—

No. 1.—	Tannin...	40 grains
	Honey	80 „
	Beaufoy's acetic acid ...	2 drachms
	Water	8 ounces.

No. 2.—Leave out the honey, and substitute half an ounce of raspberry syrup. Carefully filter before use.

The washed collodion plate must now be coated twice with either or a mixture of these two solutions, according to the colour required; drain the plate upon blotting-paper for about ten minutes, and finally dry quickly before a clear, *red* fire, or upon a hot plate. A great source of failure in the tannin process arises from allowing the sensitive plate to be exposed to an impure atmosphere for a length of time when dried spontaneously.

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* Read at a meeting of the Photographic Section of the Literary and Philosophical Society of Manchester.

* Mr. Wardley informs us that he has frequently used the alkaline development for collodio-albumen plates, and with some advantage, but that he has not recommended it because of difficulties which arise in certain conditions.—Ed.

The mode of printing upon these plates is conducted in the usual manner. It is better to err on the side of over-exposure rather than of under-exposure.

The development is commenced by flooding the plate with water, and pouring on a solution of

Pyrogallic acid	2 grains
Beaufoy's acetic acid	2 drachms
Water	1 ounce.

To each drachm must be previously added one drop of a forty-grain solution of nitrate of silver.* The image appears quickly, and can be intensified to any extent by the addition of one or two drops more silver.

Remove the iodide with hyposulphite of soda (cyanide would injure the picture). Washing with water completes the operation.

My object in bringing this short and imperfect paper before you this evening has been to give a hint that old and apparently very stupid modes of producing pictures are always worthy of our consideration, providing we can make any improvement in, or addition to them.

The first process alluded to this evening is perhaps the nearest approach to the simple albumen, especially since the introduction of the plain pyrogallic development.

The former good qualities of the raspberry process induced me to try it combined with tannin. I was much surprised to find this combination yield a picture entirely free from that abominable "halation," of which we have heard so much through the medium of the journals.

In conclusion, let me express a hope that this paper may not be considered "dry" *versus* "wet" for transparencies, for both possess their advantages.

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Proceedings of Societies.

American Photographical Society.

The American Photographical Society met at its rooms, June 12th. Mr. Tillman in the chair. O. G. Mason, Secretary.

Mr. Hull, chairman of the committee on negotiation with other societies for use of rooms, gave a verbal report of progress made.

On nomination by Mr. Newton, Messrs. O. S. Follett and Henry Fitz were elected to membership.

Mr. Weekes contributed three card prints showing fine manipulation and good arrangement of light. His collodion was made of equal parts ether and alcohol, to which was added pyroxiline sufficient for a good film.

Iodide of Ammonium	5 grains to ounce
Bromide of Cadmium	5 " " "
Bromide of Potass.	½ " " "
Tincture of Iodine	1 drop " "
Hydrobromic Acid	1 " " "

With this collodion he produced negatives of sufficient intensity without any redeveloping.

Mr. Newton contributed a nicely framed print from one of his paper negatives.

Mr. Chapman contributed a 4-4 print—portrait of a lady. He considered the addition of more bromide than was generally used advantageous to intensity.

Mr. Duchochois' experience had led him to a different conclusion, and he would like to have a committee appointed to experiment with differently excited collodions with a view of determining upon the best proportions for suitable definition in drapery and the various lights and shades of portrait photography.

Mr. Hull's experience led him to agree with Mr. Duchochois; he had found less intensity by the addition of more bromide, and he had considered the best proportion of iodising for a given strength of silver solution somewhat different from Mr. Weekes' formula. He had success, and found great uniformity in using six or seven grains of iodising to the ounce of collodion with a forty or fifty grain bath. He thought that *one* formula would *not* work equally well in all places and under all conditions—he had tried various collodions which would work well in some lights and not in other lights, and other hands.

Mr. Mason thought that photographers had given too little attention to the study of light — the quantity and quality of light best adapted to the production of suitable effects with given chemicals. He had recently examined two series of pictures—one from Berlin, Prussia, and the other from Canada —in which the two photographers, although so far distant from each other, and very likely using differently prepared chemicals, had produced very similar effects. The productions of each might well be called artistic—almost faultless. The Prussian pictures were evidently the result of careful study guided by close observation, an artistic toil, and careful adaptation of means; and this might be equally true of the pictures from Canada, but the Canadian photographer must have had greater assistance from nature, in modifying his light; for *him* the light had been subdued by a greater stratum of atmosphere through which it passed (the time being winter, and consequently the sun rising low and far South), and the reflections were from snow which purified his actinic light by absorbing most of the yellow and green rays, so he had but little to accomplish in the way of giving it proper direction. What nature fails to accomplish for us, we must settle through other means. By the use of properly coloured or partially obscured muslin, and a judicious arrangement of curtains and screens, most successful results may be obtained. He believed that in the study of light, the photographer had open to him a wide and interesting field into which but *very few* had yet practically entered.

Mr. Duchochois thought most of the recent formulas for photographic chemicals were but slight modifications of old ones, and that but little had been sought and found in new directions.

Mr. Chapman was of opinion that if Mr. Weekes' formula would produce pictures under *one* light with short exposure, they should work equally quick under all lights.

Mr. Weekes observed that with the very weak light during the last three or four weeks the yellow ray had seemed stronger in proportion, and he had changed his formula to 3 and 4 grains instead of 5 of bromide.

Mr. Tillman thought that the subject to be determined—whether the active force was retarded by the presence of the yellow ray—was a very interesting one, and worthy of careful research.

Mr. Duchochois beleived that the sensitivenees of the film was very greatly retarded by an acid state of the collodion, its effect being similar to that produced by too much acid in the bath; the intensity and detail could not be so nicely balanced.

Mr. Weekes suggested the acidifying of collodion with acetates like those of sodium, &c.

Prof. Seely was of opinion that the great difference in results with similar iodisings was often attributable to the peculiar quality of the cotton. He thought that the iodising should be adjusted to the strength of the silver bath.

Mr. Duchochois stated that when pyroxyline made in weak acid at 40° or 45° was of such a nature, that eight or ten grains would be required for each ounce of collodion, consequently such collodion would require an equal increase in the quantity of iodising. He considered that some of the best collodion was that made from cotton prepared by the use of sulphuric acid and nitrate of potash according to or near the formula laid down by the Paris school of Pharmacy. He thought that Mr. Weekes' formula would work well only with a bath containing a great deal of organic matter.

Mr. Tillman thought that we might yet arrive at that state of photographic knowledge which would enable us to measure light and determine the times best suited to a given formula.

Mr. Newton had made and used with success a collodion containing seven grains iodide and three grains of bromide; his bath was less than forty grains in strength. He thought that the colour or texture of the object and the reflection of the shadow had a great bearing upon the decision of proportion of iodising and bromising of the collodion. The prevailing tint of shadows could be distinctly seen by any one who has acute perception of colour. In portrait photography, it could readily be seen that some faces appeared *blue* in the shadows while others looked *yellow* or *red*.

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* Mr. Wardley says that the alkaline developer, although very energetic, does not yield so good a colour for transparencies as the acid developer.—Ed.

Mr. Hull proposed that a formula be decided upon, and each member should use it under his own light, and exhibit *negatives* so made at the next meeting.

Mr. Duchochois proposed to furnish sufficient plain collodion, and Mr. Mason offered the use of his light and chemical rooms for the trial of collodion sensitised with various proportions of iodine and ammonium.

After some further discussion upon the matter a plan of experiments was decided upon, to be reported at the next meeting.

Tr. Tillman then read and further explained a part of his paper contributed and published—a formal reading of which at the previous meeting was omitted.

The Society then adjourned to the second Monday in September next.—*American Journal of Photography.*

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, August 23rd, 1865.

M. Leon Vidal, secretary of the Photographic Society of Marseilles, has published some remarks in connection with the competition recently opened in enlarged photographs by the *Societé Française de Photographie* and that of the *Société de Marseille* recently closed.

These remarks were called forth by the observations of M. Regnault, the president, on a communication addressed by M. Decamps, of two positive pictures obtained by enlargement. M. Regnault says "the competition in enlargements opened by the *Société Française* is a competition of processes and not of pictures, like that of the *Société de Marseille.* The pictures sent in to the Paris competition can figure only as confirmations of it.

At first the distinction appears very sound, and when we look more closely into it we find reason to enquire what the *Société de Marseille* was thinking of in establishing a competition in pictures. What do pictures signify? Not much in truth. But as for processes, there lies the true side of the question; it is *all* or *nothing.* So the Paris photographers did not deceive themselves when they opened a competition in *processes.*

Shall we judge enlarged pictures by the process, or the process by the pictures? that is the question.

In either case, the best results appear to us called to represent the best processes, else we should be exposed to the anomaly of judging a process to be good which had furnished bad proofs, and *vice versâ*, which appears to us a singular way of judging of familiar processes in daily use, by means of which superb results have been obtained. Evidently it would be puerile to resort to anyone's proofs to test the value of such processes. For example, M. Poitevin, who has enriched our art with so many valuable discoveries, has, in proof of his several heliographic processes, shown results which, without in fact, being *fine proofs*, were nevertheless magnificent specimens in support of his process, which, rather than the proofs themselves, demands our admiration.

But in enlarging: are there any other means of knowing the value of the process except in examining the result itself? We believe not, and we firmly assert that a good enlarged picture, whatever it be, can never be furnished by a bad process.

Among several processes leading to the same result, preference may doubtless be given to the simplest and most practical.

The perfection of the optical results in enlarging is not yet so advanced that we may neglect the purely optical side of the question to occupy ourselves exclusively with the mechanical appliances of our apparatus; for however ingenious our combination of apparatus may be, it is of little consequence compared with the precise rules for obtaining with certainty a good enlarged picture from a suitable small negative. The questions of place, fixing, and moving are always easily solved.

But how will the novice know when he has attained this aim? or whether his optical calculations are true? He will take proofs and exhibit them. If the results respond to his aim, he will have attained it. In whatever way we consider the matter, a competition in enlarged pictures is in reality a competition of *pictures*, a competition in which *processes* are only secondary. Here, then, their respective positions are reversed, as must be evident from what has been stated above.

It is understood that distinction must be made between the *inventor* of an enlarging process and an *operator* using that process, and producing the most perfect results; hence the importance of knowing the nature of the process if we wish to establish a distinction between creators and imitators—between the genius that conceives and the hand that executes.

The jury of the Marseilles Exhibition were quite right in awarding their medals to Dr. Van Monckhoven for his splendid specimens. They had to consider *results*, shown by the excellence of the specimens; in their decision the *process* was necessarily included, for such good pictures could not have been obtained by bad processes; nor could the jury suppose that the less perfect specimens exhibited by other competitors were the fruits of better processes than those employed by Dr. Van Monckhoven in producing his pictures.

In opening this discussion, the object is to show the danger of adopting M. Regnault's test of merit; that excellence lies in the *process* rather than in *pictures.* This may be classed among photographic fallacies.

It is necessary to note that in using the "economical nitrate of silver bath (5 per 100) for sensitizing albumen paper," the latter must be chlorided according to a special formula; therefore, those operators who employ this bath with paper of the usual salting will be disappointed in the results anticipated; the suitable paper is known in the trade as *papier economique.*

THE AMATEUR PHOTOGRAPHIC ASSOCIATION.

Sir,—Some time back there appeared in your columns a report of a meeting of the council of this association. After giving an account of other business transacted, it goes on to say, that "Such alterations and additions were made in the rules as the Council considered suited to the growth and prosperity of the Association."

May I beg, through the medium of your valuable publication, to ask the Secretary, (or rather the Honorary Secretary) a few questions on this subject:—

1st. By what right, or custom, can the council or committee of a society alter the rules without the assent and consent of the members at a general meeting?

2nd. Is it not a rule for a statement of accounts to be rendered with the report of council yearly? Are there any accounts kept of the receipts and payments of this association; if so, why have they not been presented to the members?

3rd. By whom are the officers, council, &c., chosen and elected? and how long do they continue in office?

4th. How is the "advantage No. 5" in the original prospectus to be secured to the members?—they have no meetings, nor do they know the addresses of each other.

5th. Why should it take from three to six months (or even longer) to print a few copies from a member's negative, or *two years* before he can obtain his allotment of pictures?

6th. Why have not the members a voice in the management of the association?

I must beg to apologise for thus occupying so much of your valuable space; the subject is a public one, and of considerable importance to the "pioneers of photography." Over 400 amateurs are immediately interested, and doubtless there are many more who contemplate joining the Association; to those I would say, "Look before you leap," or you may find yourselves as grievously disappointed as I have been.

I may further state, a few days back a friend of mine wrote to the Honorary Secretary a letter embodying my first and second questions. He received an envelope enclosing a copy of the new rules, but not a line in answer to his letter; from this your readers can draw their own inference. I take it to mean: "The rules *are altered*; here they are; now mind your own business."—I am, Sir, your obedient servant,

A Member.

21*st August*, 1865.

THE MAGNESIUM LIGHT IN A LEAD MINE.

Dear Sir,—I have much pleasure in enclosing you a few specimens of photographs taken by one of my double magnesium lamps in a lead mine, one hundred and forty yards deep, showing the end of two pipe-veins now yielding an amount of lead per week value £250. The cards show a surface of about four by six feet of the richest part of the vein. The lightest parts, of course, being the lead ore, the dark parts black rock. The black rod is a drill stuck in a hole bored ready to put in a charge of powder. As the most of the ore in this mine lays in hard rock, it requires blasting out, and the ore seems to scatter off from the main centre about two feet down, four feet on each side, and is from eight to twelve, and sometimes sixteen feet high, and pays well for digging out. I have taken several other kind of veins, but as each requires some explanation, I will not trouble you with but one at once. If you think this would interest your readers, you are at liberty to use it.—I remain, yours truly,

Alonzo G. Grant, C.E.

Worksworth, Derbyshire, August 15*th*, 1865.

[The photographs enclosed are exceedingly interesting, and as perfect in photography as could have been produced by bright sunlight.—Ed.]

Photographic Notes and Queries.

Mr. Robinson's "Autumn."

Sir,—While heartily agreeing with "Respice Finem," I think I may be permitted to point out an objection to his chief illustration.

Mr. Robinson's "Autumn" does not look as "if it had been gathered straight from nature." The figures have palpably not all been taken in the same light, and there are different conditions of atmosphere and illumination apparent to the experienced observer in the landscape's various parts. Some of the picture is made up with artificial scraps quite out of keeping and character with the real appearance of the other portions of the work. Such "knots and joints" sadly mar an otherwise excellent picture to the eye of An Artist.

["An Artist" must get his eye more perfectly educated, or in a more healthy condition, and it will then cease to perceive that which does not exist. "All things are yellow to the jaundiced eye." Now, as it happens, we know something about the picture in question. We had the good fortune to be in Warwickshire just at the time that it was produced, and saw every bit of nature from which the negatives were taken. There is not a single blade of grass, not a spray of foliage, not a frond of fern in the picture that is not exactly as it was found growing in nature. The "artificial scraps" have no existence but in "An Artist's" imagination, as nothing of the kind was employed in obtaining the negatives from which this picture was printed. This is not a question of judgment or criticism, but of fact, and of fact to which our own eyes were witnesses. "See how plain a tale," as Prince Hal said, "shall put you down." It is this kind of over-knowing criticism, so easily overturned by facts, which destroys the confidence of photographers in *soi-disant* "artists." We heard, a short time ago one of the first, if not *the* first water-colour landscape painter of the day pronounce this said "Autumn" one of the noblest pieces of photography he had ever seen, remarking that it had many qualities which a painter might humbly study to try to reproduce. Regarding the figures, there is something comical in the notion of the different lights. The four principal figures were taken in one group, on one plate, at one operation, and with the same gleam of direct sunshine which stretches over the landscape at the same time. The fifth figure, altogether detached from that group, is in the shade of a cloud, which spreads a little beyond the figure on to the landscape, and is simply lit with the dull, diffused light caused by the sun being obscured by a passing cloud. This effect, of a figure in shadow in this place is, obviously, to the instructed eye, an intentional result necessary in the composition of the picture. The picture is printed simply from four negatives, two of which form the background, and are really from a continuous landscape. The group of four figures forms the the third negative, and the fifth figure on the piece of near foreground, with its clump of ferns, is a bank really adjoining the spot, where the group of four were posed and taken.—Ed.]

The Organic Iron Developer.

My Dear Sir,—For protosulphate of iron read double sulphate of iron and ammonia; and you can get any intensity without discolouration. Photographers have to thank M. Carey Lea and Mr. Hughes for their kindness in making known this developer.—Yours, faithfully,

W. H. Warner.

Aug. 19, 1865.

Skies in Landscapes.

Sir,—I have lately been a photographic tour through Yorkshire, with the intention of obtaining natural clouds on the same negative as the landscape—size stereo and 7 by 5—but am greatly disappointed at the results: although I have the pleasure of seeing the sky develop itself beautifully, yet on the completion of the negative not a vestige of the sky is to be seen.

I always take the precaution to place the opposite end to which the collodion is poured off, expecting that, as it was the thinnest edge, it would not be liable to solarise.

I use slightly acid bath, 16 grs. to the oz., Mawson's collodion, and develop with iron 15 grs., gl. acet. acid 20 mins., water 1 oz.; intensify with pyro and silver.

As I intend to start on the same tour this day week, will you, with your usual generosity, give me a little information in this week's News as to how I may become a little more successful, for I look upon a photograph now a days without sky as nothing?—I am, Sir, yours, respectfully,

J. Arkwright.

Leeds, Aug. 21, 1865.

[As a general rule the sky and clouds, especially if at all luminous, impress themselves on the sensitive plate with a very much shorter exposure than the foreground of the landscape requires; consequently, the time required by the latter gives considerable over-exposure to the former, obliterating all detail. Of course, in developing, the sky and clouds will appear the moment the developer is applied, but long before the foreground is fully out the sky has developed into one dense mass. The best aid to securing the clouds is some plan for limiting the exposure of the sky whilst giving sufficient to the foreground. For this purpose the flap shutter is useful, placed at an angle which will shut off the sky from the lens without cutting off any portion of the foreground. In some cases it is difficult to do this on account of some tall tree impinging on the sky. In such case a piece of card or stiff brown-paper, torn roughly to the desired shape, and attached to the shutter, may be employed, and will be sufficiently out of focus, if properly managed, not to cause any hard line. A screen of card torn in the same way, and fixed inside the camera an inch or two in front of the lens may serve a similar purpose. In all cases they must be removed for a few seconds to give the sky the requisite exposure to secure the clouds.—Ed.]

Talk in the Studio.

Honour for Photography.—We observe among the nominations to the Legion of Honour made on the Emperor's Fête Day, the name of Mr. Claudet, our eminent London photographer. This distinction, awarded on the ground of services rendered to science and industry, is one of which we may reasonably be proud, for Mr. Claudet is English by residence and marriage, if he was originally French by birth.—*Athenæum.*

THE MAGNESIUM LIGHT.—At the invitation of Capt. Bamber, RN., several gentlemen assembled on Monday on the central platform of the Great Western Railway terminus, to witness the effect of a magnesium light produced through an apparatus invented and patented by Captain Bambor, by which the magnesium wire is regularly supplied to the burner, producing a steady and powerful light. Unsteadiness or flickering of the light produced by magnesium wire has hitherto proved a difficulty to its general application—a diffculty, however, which Captain Bamber has unquestionably surmounted by his invention. It consists of a mahogany box, about 18 inches long, containing a series of small wheels (much resembling those of a musical box), and a drum, round which the wire is wound, and from which the burner is supplied at a rate proportionate to the revolution of the drum, whose action is cleverly governed by what the inventor terms a "regulator." The burner is enclosed by a powerful lens, or "bull's-eye" glass, which has the effect of not alone magnifying the light, but of materially intensifying its rays, so much so that at night, when the apparatus was in play, the hands of one's watch could be distinctly seen at a distance of 250 yards, and this, too, with the thinnest wire manufactured, it being of course remembered that the power of the light would be increased in proportion to the substance of the wire.

INTRUSIVE PHOTOGRAPHY.—At the recent examination at Ramsgate of the murderer Forward, alias Southey, he observed in the court a camera pointed towards him, and immediately protested against his portrait being taken in that way. He had a right to be treated as an innocent man, and claimed the control of his own portraiture. The chairman said if the prisoner objected, he had a right to do so, and ordered the photographer to desist.

RIVAL PHOTOGRAPHERS.—Two photographers, in the Euston Road, who, in conjunction with their assistants, had quarrelled in the public street in front of their two adjoining studios, had their differences settled by Mr. D'Eyncourt, at Clerkenwell Police Court, who ordered Mr. Pim to find sureties for his keeping the peace for six months, and his *touter* was fined £4 2s., or one month's imprisonment.

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To Correspondents.

EQUITY.—If the original painting were registered, or if the photographs of the original painting were registered, the copies are piracies, and the proprietor of the copyright has his remedy either by summary proceeding before a magistrate, or a suit in a court of equity. If neither were registered he has, unfortunately, no remedy. 2. Either the original picture or the photograph may be registered; but there is no copyright in the original picture until it is registered. 3. It is not necessary to register several sizes of the same picture; but if several negatives be taken of the same subject, each having a slightly different point of view or other variation, it is in such case necessary to register each. 4. A new process of any kind can only be protected by patent.

IGNORAMUS.—It is possible that the paper on which your prints were produced may have been a little defective; but the chief causes of the red or brown colour produced by the byposulphite solution are the insufficient printing and insufficient toning. To begin with, the negatives are not sufficiently vigorous to permit the necessary depth of printing. In order to secure good tones it is necessary that a sufficient amount of silver be reduced to yield vigorous blacks when toned. An under-printed picture will sometimes appear to tone pretty well, but when placed in the fixing solution it becomes brown if slightly toned, and slaty if fully toned.

F. J. DAVIS.—The question is rather one for a builder than an editor; but we should think the coal tar and lime would be more efficient than paint. We regret that we cannot write private letters on such subjects.

A COUNTRY PHOTOGRAPHER.—It is difficult to obtain paper entirely free from metallic spots. The *Saxe* paper is generally most free from this defect, but it gives less brilliant prints than the *Rive*, which, from your description, you are doubtless using. 2. Many photographers have found decided advantage from the use of nitrate of soda in the bath. You will find many articles on the subject in our 7th and 8th volumes. 3. We prefer a neutral printing bath.

C. BAKER.—The remedy for any portion of the gelatine clinging to the plate, and thus causing eventual clouding of the negative on varnishing will be found in avoiding the gelatino-iron solution for intensifying, or in washing thoroughly with warm water after the negative is fixed, before drying. It is probable also that using a strong-bodied varnish would obviate the defect.

JAMES BAIDDON.—We do not know of any one suitable for your purpose.

TARANAKI.—Of those which you mention we prefer the D or the B, the last, probably, is best suited to your purpose, inasmuch as the front lens of the combination will form a six-inch single lens for special purposes. The others you mention are good, but have been surpassed since the time to which you refer. 2. As a rule, the shorter the focus of a lens, the more rapid its action; but in order to be accurate you must bear in mind that it is the relation of aperture to focus which governs the quickness of lenses. The wider the aperture and the shorter the focus the more rapid the action of the lens. Hence, of two lenses of the same focus, that which will define well with the largest stop will be the quickest lens. 3. Negatives are not so generally the subjects of sale and purchase as to have acquired an average selling value. They are rarely bought except at a disadvantage to the producer. Subjects really required are generally commissioned at an agreed price, first-rate photographers generally commanding a guinea a piece for stereoscopic negatives. Negatives of New Zealand, of good and of well-chosen subjects, would probably find purchasers in some of the large publishing houses, such as Marion, &c., or the Stereoscopic Company; but the price would necessarily be the subject of specific negociation. Thanks for the beautiful sample of resin. It appears to resemble amber in many respects. We shall have pleasure in testing its suitability for varnish, and reporting further.

PIP.—The cause of your troubles was doubtless organic matter in the bath, which was reduced and removed by boiling down. If when you added carbonate of soda or cyanide you had also sunned the bath you would probably have got rid of the defect. 2. The tendency to irregular draining and greasy-looking streaks of solution on the film sometimes arises from an accumulation of ether and alcohol in the bath, and sometimes from the character of the collodion, being horny and repellant, or made with anhydrous solvents. In the last-mentioned case the addition of a drop of water to each ounce of collodion will prove a remedy. 3. The rate at which a bath is robbed of its silver can only be ascertained by observation. In hot weather it will evaporate so as to lose water almost as rapidly as silver. Some samples of collodion contain more iodine and bromine than others, and thus take away more silver; some collodions yield thicker films than others, and thus take away more silver. It is, therefore, impossible to say with certainty to what extent "exciting a dozen 5 by 4 plates per day for 10 or 12 days" will impoverish a bath. You may, however, in round numbers estimate that every ounce of collodion used robs the bath of 4 grains of nitrate of silver, and you may easily estimate whether it is losing water in the relative ratio necessary to maintain the strength of the bath. 4. In all professional establishments, great or small, two or three baths ought to be kept ready for use, so that in case one is out of order, or meets with an accident, another shall be ready so that business may not be interrupted. 5. The production of twenty-five portrait negatives in a day is a thoroughly good days' work. If the work be well done an average of twenty in a day would be a good days' work. It is impossible to secure good work if driving haste is maintained. One portrait in every quarter of an hour is very rapid work when all contingencies are calculated.

IGNORAMUS No. 2.—It is safer to intensify in the dark or in a dull light, especially if the slightest tendency to fog be present. 2. The calico for a background may be stretched quite tight on its frame very easily. One side is attached to the frame with tacks, and then the opposite side, pulling tight all the time; one end is then nailed down and then the opposite end, stretching again all the time. If properly done, although it may slightly vary in tightness with the state of the atmosphere, it will not do so to such an extent as to require re-straining. If that were necessary, it would be very easily effected by using wedges at the corners of the frame, in a similar manner to that employed in straining canvas for oil paintings. There is nothing better than oil flatting for plain background, but it requires a little skill in painting to secure a flat and even effect. Distemper answers very well, but is more easily injured than oil flatting.

J. C. H.—We do not remember Mr. Bileliff's address. It is probable that a letter addressed to him as manufacturer of photographic apparatus, Manchester, will find him. We shall have pleasure in stating our opinion of the specimens of your work.

LIZZIE.—We have not heard of any London house undertaking to prepare paper for Dr. Van Monckhoven's new process, but we think it is probable the materials will be supplied by any of the manufacturing photographic chemists, such as Hopkin and Williams, New Cavendish Street. We have seen prints produced by the process, which are, we can assure LIZZIE, exceedingly fine. We will make some enquiry as to the sale of the prepared paper.

J. THOMPSON.—Russian glue is not soluble in absolute alcohol, but by breaking the glue into small pieces and allowing it to soak for some time in equal parts of alcohol and water, it will soften, and may then be dissolved by gentle heat. Probably about one ounce of glue in ten or twelve ounces of spirit and water will answer.

BANDON.—The formula of M. Hermages, stated in English weights, in round numbers stands as follows:—

Water	8 ounces
Starch	5 drachms
Chloride of sodium	5 ,,
Sugar candy	8 grains
Tartaric acid	8 ,,

The starch may be boiled, or skilfully mixed with boiling water so as to be converted into a gelatinous form, it will not then dry in a powdery state. Wherever solutions are applied by sponging great care is necessary to prevent streaks. The best plan is to use the sponge full of the solution, and go over the surface of the paper two or three times very lightly; but taking care to cover well.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

MINSHULL AND HUGHES, Eastgate Row, Chester,
Four Photographs of Rev. Canon McNiell, of Chester.
WOLSTENHOLME BROS., Rhodes, Lancashire,
Two Photographs of the Locomotive Engine employed by the Lancashire and Yorkshire Railway Company, taking the Prince of Wales to the opening of Halifax Town Hall.
MR. C. M. DAAYSON, George Street, Canterbury,
Two Photographs of Archdeacon Croft, of Canterbury,
MR. THOMAS BENNETT, Foregate Street, Worcester,
Photograph of Miss Simms, Adelaide Road, Haverstock Hill, London.
Photograph of Mrs. Stephenson, of Adelaide Road, Haverstock Hill, London.
MR. ROBERT SELFE, Queen Street, Bridgewater,
Three Photographs of Henry Westrop, Esq., M.P.

THE PHOTOGRAPHIC NEWS.

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PICTORIAL PHOTOGRAPHY AND COMBINATION PRINTING.

WE have a few words to say on the subject of a communication which appeared in our pages a fortnight ago, entitled "The Sphere and Scope of Photography in Art." It appears to us that the question really narrows itself within very simple and clearly defined limits. In the first place, it is necessary to decide whether photography can legitimately have a pictorial purpose, or whether it should be confined to the duty of a scientific registrar and witness of facts; and in the next place, if it be decided that photography has any place in art, and may be employed in producing pictures which shall bear the impress of an artist's mind, the question arises as to whether the artist is to be limited strictly to the employment of the commonplace appliances of photography, or whether he may supplement these by his own skill, ingenuity, and effort, so as to compass greater results than these appliances will ordinarily achieve. The whole subject at issue seems to be comprehended in these two questions.

We really fancy that we should be wasting the time and exhausting the patience of our readers if we attempted to enter into an elaborate argument to prove that photography is legitimately employed in producing pictures which shall bear the impress of the artist's mind. That question has been answered long ago, in a very practical fashion, by the multitude of photographs which have extorted the praise of sometimes unwilling admirers, both artists and connoisseurs. We risk nothing, we think, therefore, in taking the answer to the first question for granted. It is in regard to the second question that we ask the attention of those interested in the enquiry to the recognition of a few indisputable facts. It is indisputable that photography is limited in its appliances. Notwithstanding the great progress which has been made of late years in the capacity of lenses, the photographer is still confined in rendering pictorial subjects at one operation to a restricted angle of view. In defining objects in different planes he is bounded by the capacity of his lenses. In the production of large pictures he is circumscribed by the difficulties of process, and the conveniences of baths, plates, and cameras. In the delineation of moving objects, and the catching of expression, &c., rendering necessary in one part of the picture rapidity of exposure, whilst other objects demand protracted exposure, he is circumscribed by similar material or chemical difficulties. These are impediments inherent at present in the facilities presented to his hand, and the question, as we have said, resolves itself into the inquiry whether he is to accept these material limits, or, by the exercise of skill and ingenuity, to overcome them. Our answer is, that the legitimacy of his attempts to overleap these difficulties, should be decided solely by the success of his efforts in producing a presentable or satisfactory result, in embodying his pictorial conceptions.

Waiving the considerations raised by our correspondent, "Respice Finem," as to the actual veraciousness, under many circumstances, of photographic representation, we accept the position of Mr. Slight, that truth should be the touchstone of legitimacy in pictorial photography. Whenever untruth is the result, the effort is a failure. We admit all the difficulties involved in producing a picture by the use of several negatives in combination printing; we go further than Mr. Slight, and admit higher difficulties than those to which he referred. The production of a picture from heterogenous materials, gathered from the different parts of the world, would not be difficulty, but folly. But the production of a picture in several negatives, from harmonious materials, involves difficulties not familiar to those who have not attempted to produce a similar picture from similar materials by painting from nature. We wish very carefully here to avoid indulging in that rhapsody which has been too common in some who have familiarized themselves just enough with art terminology to talk the slang of artists and would-be art-critics. It is very easy to ring the changes on a series of phrases such as harmony, keeping, subordination, &c. Nevertheless, these words have real meaning, and the qualities they describe depend, for their existence in a picture, on the recognition on the part of the artist of a series of subtle details, difficult to express in terms, but easy to perceive, and, indeed, inevitable to the eye of the really instructed artist. The unity and keeping of a picture are not things merely dependent upon the lighting, of all the objects being manifestly from one main source, or the presence of a similar tone and atmosphere throughout the picture, but also upon such minor points as the reflected lights on each object being really harmonious with the surfaces from which they are reflected, and a variety of other details, too subtle to be readily catalogued. Difficulties of this kind, it will be perceived, require great art and thorough knowledge to overcome. Where the requisite judgment and perception to appreciate and skill to surmount are wanting, the result of an attempt will be failure.

But the existence of difficulties is the worst argument we know against the attempt to secure a desirable object. If the aim be good and the means be honest, even failure is no shame, and well-intended though unsuccessful effort is not very blame-worthy. But in this walk of art we, as our readers well know, hold the conviction that photography is not wanting in examples of very high, or indeed the highest success. Whilst we cordially endorse the remarks of "Respice Finem" on the impolicy, not to say the absurdity, of attempting to render by photography subjects belonging to imaginative art, we hold, that all which the eye of the camera might actually see composed in one group or scene in nature, it may legitimately render, piecemeal, if its appliances are unequal to the rendering of the whole in one photographic operation. It is unnecessary for us to repeat our appreciation of some of the examples referred to by "Respice Finem," such as the "Autumn" and "Bringing Home the May" of Mr. Robinson; compositions as replete with truth as they are with poetry, and which, to our personal knowledge, have received the highest encomiums as pictures, without reference to the mode of production, from some of the highest names connected with art, royal academicians and others. But we may refer to a much smaller illustration of our favourite apothegm, to the effect that success is the touchstone of legitimacy. In the present North London Exhibition is a little group, by Mr. Downer, of Watford: it consists of a child on a donkey, by the side of which stands a lady, with a distant landscape as background. The picture is small, not exceeding five inches by four, but the whole composition is so perfect and harmonious, the foreground and figures so well defined, the landscape so atmospheric, and forming such a perfect background to the figures, that it is certain to attract the attention of the educated observer. This picture has been the subject of several discussions amongst technical admirers, the question arising as to whether it was produced from one negative, or was the result of combination printing. From a letter before us we learn that it it is from two negatives. Its artistic qualities are the result of study and arrangement, not chance. Such a result might possibly have been obtained at one operation on one plate, but will the most scrupulous antagonist of combination printing tell us that the picture, the natural truth of which has been avouched by the discussions to which we have referred, is less valuable because it has been produced by design, and skilful effort to overcome photographic shortcomings, than if it were the accidental issue of fortunate circumstances at one operation?

Without elaborating the argument, we wish to enforce this consideration on the attention of those concerned, that combination printing is simply a succedaneum for the shortcomings of photography and photographic appliances; that untruth in combination pictures is not on any occasion a legitimate argument against the method, so much as a proof of incapacity in the man applying the method; that so long as there exists a disproportion between the ordinary means of production in any art and the conception of man's mind to produce, higher skill and greater effort will be necessary to supplement the ordinary means. And, in an art like photography, the credit due to the artist, and the appreciation of the admirers of the art, should be in the exact ratio of the greatness of the conception, the inadequacy of the means, and the perfection of the result.

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THE BERLIN MEDALS.

We have much pleasure in giving publicity to a communication from our esteemed friend and *confrère*, Dr. Vogel, regarding the awards at the late International Photographic Exhibition at Berlin, which appear to have been the subject of some misunderstanding and misappreciation. We have the greater pleasure in publishing Dr. Vogel's letter, which completely answers the erroneous statements made and incorrect deductions drawn, because it had appeared to us that some excess of liberality had been used in making the awards. It will be seen, however, that not only are the statements, to the effect that every exhibitor in this or any country received a medal, erroneous, but that the number of honorary awards was less than those in the Photographic Department of the International Exhibition of 1862. It is very gratifying, however, to know that the greatest number of honours, in proportion to exhibitors, fell to English photographers, sixteen medals being awarded amongst eighteen exhibitors, and one to ourselves for a discovery, although we did not exhibit. When it is remembered, however, that to an exhibition at such a distance only the ablest photographers, as a rule, would forward contributions, the large number of honours is easily understood. We now append Dr. Vogel's letter:—

"My Dear Sir,—I observe in the English journals various signs of disapproval in regard to the apparently large number of medals which were awarded at the Photographic Exhibition here. Attention is called in one statement to the alleged fact that every English exhibitor has received a medal; and, instead of being rejoiced at this acknowledgment of the worth of the products of their countrymen, the worth of the awards is by some depreciated. It is very easy to condemn the decision of a jury when one is not acquainted with the motives which caused their decisions, nor with the relations under which their activity was exercised. But in suppositions of this kind one should be careful to take into consideration that among the gentlemen who composed this awarding committee there were those who, in England, are held in the highest consideration, and who have previously and repeatedly officiated in this capacity. I will here name Professor Dove, the celebrated professor of meteorology, etc.; Professor Hofmann, the celebrated chemist, formerly in London; Professors Magnus, Du Bois, Reymond: the able artists Steffeck, Richter, and other men of high reputation.

"Allow me to give you a short statement of the actual facts. The number of exhibitors at our exhibition was 291. The number of those who received medals was 138. Thus the supposition of the *British Journal*, that every exhibitor received a medal, is groundless.

"The distribution of medals was as follows:—

	Exhibitors.	Medals.
England	18 ...	17
(With one to Mr. Wharton Simpson, who did not exhibit.)		
France	30 ...	22
Germany	129 ...	76

The other countries, Italy, Russia, Scandinavia, I will for the present leave out of consideration.

"Let us compare with this the number of medals awarded in the Photographic Department of the London International Exhibition of 1862:—

	No. of Exhibitors.	No. of Medals awarded.	No. of those who received hon. mention.
England	169	26	52
France	119	32	46
Germany	38	13	15
Total	326	71	113

The number of the medals awarded there was indeed smaller than at the Berlin Exhibition, but if one adds thereto the 'honourable mentions,' the number of honours granted is decidedly larger.

"At the Berlin Exhibition, in accordance with the decisions of the Photographic Union, there were no 'honourable mentions,' medals being the only awards.

"Hence, since there were also products of the second class which were worthy of notice, such as showed a worthy endeavour or an original idea, or such as were produced under very difficult circumstances, the jury was, in part, obliged, in accordance with the decision of the Union, to crown some with medals, which under other circumstances would have received only 'honourable mention.' By this means the number of medals was, indeed, increased, but at the same time time the marks of honour remain less than the number of those which were awarded at the London Exhibition.

"All may not, perhaps, be agreed in regard to the manner of awarding medals. The circumstances, however, seemed to require it, although I confess that it might have been better if the Society had adopted also the 'honourable mention.' In regard to the medals awarded to English exhibitors, I consider that all fully merited their medals, and would have received them if the number of awards had been reduced by half.—Yours faithfully, H. Vogel.

"P.S.—Allow me to correct an error. Mr. Swan was awarded the medal, not for one carbon print, but for excellent carbon prints.

"*Berlin, August 20th*, 1865."

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THE NORTH LONDON PHOTOGRAPHIC EXHIBITION.

The Medals.

We have not hitherto, for obvious reasons, as occupying a position among the jurors, made any critical observation on the pictures at this exhibition. The awards having now been made, the motive for reticence is removed; and we shall in one or two articles briefly review such of the contributions as appear to demand especial notice.

We may, at the outset, indicate the exhibitors to whom awards have been made, observing, however, that as the jurors will publish a detailed report of their views in making the awards, it may be found that the explanations accompanying the decisions may, in some degree, qualify the awards. The medals as originally decided upon were, in general terms, for "the best" of contributions in certain departments, a discretionary power in construing the terms being left in the hands of the jurors. In examining the contributions at an exhibition like the present, containing so many meritorious objects, it soon becomes apparent that the term *best* cannot be easily construed in any absolute sense. Half a dozen examples of portraiture may, for instance, each be best in certain respects. One may be the best in arrangement and composition, another in lighting, another in life and expression, another in technical photographic excellence, and so on. In cameras, one may be best in design, another best in cabinet-work. In lenses, one may be the most rapid, another may define the most uniformly and another the most sharply over a given space, another may include the widest angle, and another may be most free from distortion. These difficulties have been urged by some as a reason against making such awards at all. Of course, at all times, the easiest mode of disposing of difficulties is to shirk the task in which they are involved. This is a very easy mode of solving the problem of life. To avoid the difficulties of navigation, don't go to sea; to escape the difficulties of commerce, avoid buying and selling; and so on *ad absurdum*. As the object of medals is to reward merit, encourage emulation, and give a zest to competition, it becomes the duty of the jurors to make these awards in such a mode, as will, in their judgment, best carry out the intention in giving medals, and this they believe is best secured by adhering to general grounds, and selecting for honours those contributions which possess the highest aggregate of general excellence. A medal, therefore, at such an exhibition expresses the verdict of five gentlemen, chosen for their culture or experience in the art, as to the success of the recipient in producing results worthy of the highest commendation. It is an honour; and the pursuit of such honour has been the source of progress in everything great and good in the world's history. To the braggart Falstaff honour was "a mere 'scutcheon." We do not think many photographers share his views.

Dealing with the subject in the spirit we have described, and construing *best*, in some instances, as indicating a possession of the most general photographic excellence, the jury have made the following awards:—

For the best portraits: Mr. E. W. Foxlee.
For the best landscapes: Mr. F. Bedford.
For the best pictures from dry plates: Mr. Mudd.
For the best enlargment: no award.
For the most artistic pictures: no award.
For the best instantaneous pictures: Mr. V. Blanchard.
For the most meritorious invention: Mr. Walter Woodbury.
For the best cameras: Mr. Meagher.
For high general excellence in lenses: medals both to Mr. Ross and Mr. Dallmeyer.

We will not attempt to anticipate the jury's detailed explanation of the grounds of the awards generally; but as, in one or two instances, there is a departure from the original programme, we may indicate the causes. In enlargements the contributions were extensive, and, in many instances, exhibited high excellence; but amongst the best there were many points lacking, and none which were definitely in advance of many others; and it was deemed desirable to avoid affixing on any the stamp of the highest success. The most artistic pictures were with one voice pronounced to be those of Mr. Robinson, and as they were marked not for competition, Mr. Robinson having accepted a position on the jury, no award could be made without honouring, as best, confessedly inferior pictures. The medal thus placed at the disposal of the jurors was unanimously awarded to the instantaneous pictures of Mr. Blanchard. The open medal, intended to meet any kind of excellence in the shape of inventions or discoveries which might not be anticipated beforehand, was awarded to Mr. Woodbury for his examples of Photo-relievo printing. The question of lenses necessarily presented the greatest difficulties, as only two opticians contributed, and these were each well known to be of the highest merit. If the duties of the jurors had been those of a lens committee, from whom was due a detailed comparative estimate of the scientific merits and practical value of all the lenses exhibited, a series of careful comparative experiments with every form of lens in the exhibition, requiring months for its completion, would have been necessary, and even after it was completed it could only express in brief a verdict as to the balance of good qualities. They felt therefore that here pre-eminently they must fall back upon the expression of high general excellence, each member of the jury having sufficient experience with the productions of the competitors to warrant an unanimous decision; and it was resolved to give to each of the exhibitors a medal for this high general excellence. As we have said, the official report will explain and qualify, by a due statement of the grounds of the decisions, and recognition of the merits of some other contributors, the awards which we have in general terms announced.

We must postpone, for lack of space, any critical remarks of our own on the contributions.

◆

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Those who Curse—Mr. Moens—The Permanance of Photographs—Portrait Snatchers—The North London Exhibition—Mr. Robinson's "Autumn"—Mr. Woodbury's New Process—The South London Society's Out-door Meetings—Royal Patronage—Medals—Difficult Reading—Honours to a Photographer—The New Developer—Mr. Slight's Paper.

"You taught me language; and my profit on't is, I know how to curse," said the physically monstrous and mentally deformed Caliban to Prospero, when he reminded him of the benefits he had conferred upon him. The thought is typical of many misused powers and abused privileges. Photography is one of the beautiful powers recently given to man, and it is amazing to what extent many men misuse the art which should be a blessing to themselves and to mankind. Certain photographers have been forging Russian rouble notes by its aid: how they could hope to do this without discovery is a puzzle. Although so much has been said about the exact reproduction possible to photography, there is a limit beyond which it is impossible to go, and the most ignorant would be able to discover the difference between a real note and its photographic representative, unless indeed they intended to use some process of photo-engraving, in which case it is possible that a facsimile might be produced which would puzzle even experts. Photography has been learnt by others that they might produce indecent stereoscopic slides and nude nastinesses. Many other evil-minded Calibans could say to photography —as great magician as was ever Prospero—"You taught me language, and my profit on't is, I know how to curse;" but amongst the most mischievous is the typical psuedo art-critic, who intrudes his opinions now and then amongst those of qualified instructors, and, with scant knowledge of art and imperfect knowledge of grammar, uses the language of the art to mislead its votaries, and, if possible, hamper the progress of those who are reaching the goal which is but as a dream to himself. The gentleman from Kansas prided himself that he was "half horse, half alligator." The class of critics to whom I allude possess a similar hybrid character, jacks of all trades, but good at none, and successful in nothing. They simply learn the cant of criticism, and use it to the degradation of art and the insult of artists. Photographers need no longer fear this kind of critic; the bubble is burst. As with the Russian note-forgers, the counterfeit is discovered.

Photographers generally, and the members of the North London Association in particular, must have been glad to see the advertisement boards of the evening papers on Saturday last, the first and most important heading on which was "Release of Mr. Moens from the Brigands." Mr. Moens' name has now become so well known throughout Europe, that everybody recognises it as that of the gentleman who has been so long in the hands of the brigands, and has suffered so much from them. His brother photographers may expect a rare treat when he recounts his adventures, which it is to be hoped he will do in a paper at Myddelton Hall. When rogues fall out, honest people come by their own. It appears that the brigands could not agree amongst themselves how much should be taken for Mr. Moens' ransom, and the result was that five of them stole him from the rest of the band and sold him at their own price, a very large sum of money. The Italian Government would be doing a graceful act, as well as a just one, if they refunded this money.

So it seems the photograph is not so wanting in permanency after all. A writer in the *Standard*, referring to the proposed national exhibition of portraits, says, that it would give photography a chance of wresting from the slow but sure progress of decay and annihilation the oil paintings exhibited. This is a compliment to their art that photographers could not have expected.

Prisoners under examination for any notorious crimes have now not only to defend themselves from the law, but they have also to dodge the photographers, who, perched on any coign of vantage, make attempts, however hopeless, to snatch portraits of the wretched men or women who have attained a brief notoriety. It matters not how bad these portraits may be, so that they offer sufficient excuse for a large sale. At Ramsgate the other day, when Southey was before the magistrates for the murder of his wife and children, he suddenly discovered an enterprising if not impertinent photographer focussing him through the window of the court. However proud he might have been of his wholesale murder, he could not stand this, and therefore made a strong appeal to the magistrates, who ordered the photographers off. How do these fellows get into these places? Of course they have unbounded "cheek," and will attempt anything; but why did the police allow them to set up their camera in the window?

Everybody, including the committee, is astonished at the extent, variety, and real excellence of the photographic department of the Agricultural Hall Exhibition. In an exhibition so well managed and so full of interesting objects it would be satisfactory to know that photography was respectably represented; but when it is known that it is one of the principal attractions, it must be a source of great gratification to the North London Association that their committee have worked so well and succeeded in collecting perhaps the finest exhibition of photographs that have ever been brought together. Nearly every application of the art is represented, from the largest compositions down to photo-sculpture. This same photo-sculpture is the greatest disappointment the committee have had. They took some trouble to obtain specimens, but found, when they had got them, that they were so indifferent, and so covered with advertisements of "Twelve Cartes for Five Shillings" to be had at the same place, that they were glad to get rid of them and turn them out of their department. Advertising is an evil the committee are determined to put down. The photographic gallery is not a shop for the exposure of any man's goods, but is intended as an exposition of the progress of the art. If the committee, out of kindness, have admitted works which do not bear this construction, that is no reason why these pictures should be stuck all over with advertising cards or attended by a touter. The committee, I understand, now go round occasionally and remove everything in the shape of an advertisement that might have been stuck to the frames during their absence.

An ingenious gentleman, who signs himself "An Artist," a title of honour to which his letter shows he has not the slightest claim, has just made the wonderful discovery—and, to give the world the benefit of his shrewdness, he immediately rushed into print with it—that Mr. Robinson's "Autumn" was not only bad in other respects, but that it was not "gathered straight from nature," but was made up of "artificial scraps!" Fancy the prodigious labour it must have been to Mr. Robinson to have manufactured a landscape composed of a river, groves of trees, and two or three miles of country, to say nothing of the figures, which were stuffed, of course!

A new invention was never more pleasantly welcomed to town than was Mr. Woodbury's "Photo-relief Printing Process in Transparent Ink" a week or two ago, when Mr. Wharton Simpson invited a few gentlemen to his private residence to meet Mr. Woodbury and see him go through his process. The operation has been described by the inventor elsewhere; I need not, therefore, go into particulars, but I must record my conviction that this is one of the most important processes, economically, that has ever been introduced. The fact that one man can print 120 impressions in an hour is sufficient evidence of this. Besides the purposes to which it is already proposed to apply it many other important uses are continually suggesting themselves, and a great amount of success has been attained in the reproduction of portraits.

The next out-door meeting of the South London Society will take place on Saturday, September 2, at "Jack Straw's Castle," about two o'clock. This will be the last of the season; and let no member plead the excuse that he forgot all about it. The first out-door meeting of the year was attended by five or six members, the next by three, notwithstanding that it was held at Richmond, certainly one of the most convenient and beautiful spots round London. Hampstead is easy of access, and if members cannot come at two, let them come at five o'clock. Saturday afternoon being usually a holiday, ought to enable all members to attend.

Royal patronage on photography has not always been well bestowed; the portraits published of the royal family have not often justified the choice of the photographer. The Queen has at last met with a rare exception in Mr. Hughes, who has recently surpassed himself in some very charming single portraits and groups of the Princesses. One group, about ten by eight in size, does not require to give it interest the adventitious aid of the figures being royal portraits, or even portraits at all, but is a brilliant and well-composed picture of two young ladies, natural in attitude, charming in expression, and altogether excellent in every respect that goes to form a good photograph and beautiful picture.

A distinguished numismatist tells me that the Berlin medal is a fine example of the medallist's art, and that the art of producing the peculiar mottled bronze in which it is struck is only known in Germany. Some objections to medals or any rewards to photography have recently been made. I never before heard that the award of honour was repressive of emulation and effort, as some person appears lately to have discovered, nor that it was a reproach to and tended to degrade photography. How it can be a reproach I cannot see; a honorary reward is the highest form of appreciation that the world knows. The greatest prize that can be given to British soldier or sailor is the Victoria cross, worth intrinsically about two-pence half-penny, and yet there is not a man in the army or navy who would not risk his life, even were the chances a hundred to one against him, to obtain it. It is well known that medals have improved the standing of photography as an art; many of the best pictures which have been exhibited during the last three or four years have been made with a view to medals; and to show how medals are appreciated, is there a photographer who has obtained one who would part with it for any price whatever? Curiously enough, honours appear to be objected to only by those for whom there is no hope, those who never by any chance obtain so much as honourable mention. There are two or three photographers I know who do not exhibit because medals are given, and they, modestly, and possibly erroneously, thinking they have no chance, are too proud to appear second. A parallel to this would be a soldier refusing to fight because the man next to him in the regiment was stronger and bigger than himself, and could do more fighting. This system would leave the nation with only one man to fight its battles, because, as no two men are alike, one man must be stronger than the other.

There has been a good deal written lately on the constitution of the photographic image. I have being trying to understand the question, and write this after a day's effort, exhausted. When I look at the image appearing on my plate, I prefer to be in the state of mind in which George the Third found himself when he contemplated the phenomenon of the apple being inside the dumpling, and "wonder how the devil it got there." I duly appreciate the perseverance and ingenuity of the gentlemen who enter into these investigations, and have no doubt that something practical would issue from a definite settlement of the question; but personally must confess my still higher appreciation of the labours of the same gentlemen when they contribute, as so many of them have done, something to improve the practice of our art. I generally fancy that the battles of Big-endians and Little-endians are more interesting to themselves than to the community generally.

The Emperor, amidst all the worry of governing a nation and teaching other rulers how to govern theirs, never forgets art and science, and he has done the right thing in awarding the Cross of the Legion of Honour to a photographer, we might almost say an English photographer, for Mr. Claudet has been long enough here to become a naturalised Englishman. I presume the award has been made in consideration of Mr. Claudet's contributions to the early improvements in photography, as well as to his general contributions to science.

Some of the best technical qualities in a portrait negative are roundness and relief. This, of course, is principally a matter of lighting; but it is possible to have your chemicals in such a state that they will produce flat, unsatisfactory pictures, however well the model is lighted. Mr. Hughes has taught us something on the management of light for the purpose of obtaining the desirable qualities mentioned. He now suggests another element of success, a new developer, or rather a simplification of one proposed by Mr. Carey Lea. The formula for this developer is given in the News for Aug. 18th, and it is very simply prepared. It is a great improvement on the ordinary developer of iron, or of iron and sugar, and produces clean, harmonious negatives, picking out the high lights, and having that rich creamy bloom which is so delightful to see. In many cases the requisite intensity is produced at one application.

At the Edinburgh Photographic Society Mr. Slight, the hon. secretary, read a paper "Concerning Art Photography," in which he combatted the popularly-received notions on this subject. There is no great harm in ventilating the subject, especially as his views were confuted at once by the members attending the meeting. It also had the great merit of producing a long answer in a letter to the News from a correspondent signing himself "Respice Finem," which thoroughly goes into the matter; indeed it is so complete that it leaves little more to be said.

◆

GELATINE COMBINATIONS WITH THE IRON DEVELOPER.

BY NELSON K. CHERRILL.

Having read, with much interest, the details of the new developers, as prepared by Messrs. Carey Lea and Hughes, I tried a simple experiment in the same direction, the result of which, though nothing new, may be interesting or useful to some of your readers.

It will be at once seen that Mr. Hughes' solution is quite different from Mr. Lea's, for, by the addition of sulphuric acid to gelatine, Mr. Lea forms a solution containing a substance known as *Glycocine.*

This substance, to which, in part at least, the intensity derived is due, is not present in the developer of Mr. Hughes, for acetic acid added to gelatine will not form glycocine, and it is very improbable that glycocine is found, even if there is some chemical action between protosulphate of iron and gelatine; at any rate, if any is found, there can only be a very small proportion of it.

It is very curious that two solutions, each containing gelatine, and one containing besides glycocine, should give a similar result. The subject, probably, if investigated, would lead to some considerable improvements, even upon the now comparatively perfected state of the iron developer.

Three drachms of gelatine were placed in a thin glass beaker, with a very little water, and concentrated sulphuric acid was then added quickly. Of course the temperature rose very considerably. In about five minutes the whole of the gelatine was decomposed, and the resulting brown liquid (brown, probably, through the presence of some form of *carbon*), being diluted to about five bulks, with water, was rendered slightly alkaline with liquor ammon. fortis. The quantity to the drachm of converted gelatine, or more properly glycocine, being calculated, a developer was made up as follows:—

Protosulphate of iron	30 gr.
Glacial acetic acid	20 min.
Glycocine, as prepared	1 gr.
Alcohol	10 min.
Water	1 oz.

With this developer, and many modifications of it, I found that fogging was quite out of the question. Plate No. 1 (enclosed) is the result of a most careful attempt to fog a plate after a full exposure, the developer being kept on for about five minutes, the whole picture being out in one minute; after which silver was added to the developer and the action further continued.

Plate No. 2 was taken with this developer, and not intensified.

I now made up a developer as follows:—

Iron	about 60 gr.
Glacial acetic acid	30 min.
Gelatine	$\frac{1}{3}$ gr.
Glycocine	about $1\frac{1}{2}$ or 2 gr.
Water	1 oz.

This solution did not give much more intensity in my hands than the first one, but flowed over the plate with great ease. With it No. 3 Plate was taken, being slightly intermixed with free silver in the developer.

If any of your readers (not being chemists) wish to try the experiment of making glycocine as described above, one caution may not be out of place. The acid glycocine must be diluted with water to a considerable extent (I have given 5 bulks), in order to make it safe to add ammonia; a serious accident might occur from not attending to this simple precaution.

The result of adding *hot* sulphuric acid to gelatine is still, I think, glycocine; if not, it seems to answer just as well. Glycocine is—

$$C_4 \quad H_5 \quad NO_4.$$

A description of glycocine, &c., will be found in "Fownes's Manual of Chemistry," pp. 522 and 667.

Belmont Lodge, Lee, S.E.

[The three negatives forwarded by Mr. Cherrill with this communication possess excellent qualities of delicacy, vigour and cleanness, with that peculiar bloom which generally characterizes the first-class negative.—Ed.]

◆

A JOURNEY IN SEARCH OF FOOD FOR THE CAMERA.

BY A LAZY CONTRIBUTOR.[*]

Carisbrooke Castle is certainly an interesting ruin, but unfortunately does not offer much material for the photographer. The entrance-gate makes a good picture, and is the view most familiar to tourists, but, it excepted, there are not many striking pictures to be made here, and the most enthusiastic admirer of the castle for its historical associations must admit that its claims to rank with the picturesque ruins of England are fixed upon a somewhat meagre foundation. The view from the top of the keep, looking down on the ivy-covered crumbling walls in the foreground, and then away for miles over highly-cultivated undulating country, is one of the most beautiful in this very beautiful island, and quite repays one for the toil up a most uncountable number of time-worn, pilgrim-worn steps.

Carisbrooke Church is so pretty with its lichen-stained grey tower, keeping watch over the rudely-memorialed tenements of a past generation, high above the road, as though the very graves soared upwards, that we are tempted to see if the inside is worthy of the exterior. We are soon satisfied. Accumulated ages of churchwardendom are here represented by their labours, and the total result is a precious jumble not easily described. Almost every original architectural feature is so distorted and marred by plaster and whitewash, that we are glad to get out again and far away. *Multum in parvo.* There is a tour of the entire island, and all in one day, and that, too, at an absurdly small sum. The interests of the camera laid up at home demand that I lose not this opportunity to see so much, under such favourable circumstances; therefore I am not the last arrival on board the steamboat. We started gloriously from Cowes, for the day was almost more than we could desire, for besides being very fine it was intensely hot (no great peculiarity in this island, by the way, I believe). The Solent was like a mirror reflecting heat as well as light. The shore is flat at starting, gradually sloping upwards into the interior of the island, but covered with vegetation, and therefore pretty. The shore is also flat on the English side of the Solent, and clearly shows that at no very remote geological period the island was wedded to the mainland, though now luxuriating in the comparatively new sensation of a divorce, obtained through the kind offices of *padre* Neptune. The first object of interest is Yarmouth, an uninteresting town, but said to have been of importance formerly. We vote it flat, and, therefore, worthy of its fate. Next comes the nearest point to the mainland, Hurst Castle. Its situation is singular, for it is placed at the end of a long strip of shingle barely above high water mark. The old castle is mated to some very new fortifications that look uncomfortably mischievous, but are soon left behind and out of mind, for the Needles are now in sight, but very diminutive at present. Curiosity to see this *lapsus Neptuni* is accompanied by some qualms on the part of the feminine portion of the passengers near, for a lady has just heard a gentleman say that the captain has told some one that we must all look out when we get round the point. He said nothing more, but he blinked his weather-eye, and that had an ominous look.

We have now reached Alum Bay, and admiration of this beautiful spot is unbounded. We do not land here, and therefore it is difficult to say how far the photographer would be successful here; but, seen from the sea only a short distance from the shore, the view is everything that the most fastidious could desire. Immediately before entering the bay the land abruptly rises, and steep cliffs take the place of the smooth, verdant down we have lately left. Higher and still higher the coast rises with a graceful curve outwards into the sea, and then breaks off abruptly with a sharp point; and, beyond this again, out of the depths of the sea, high up into the air, the rocks known as the Needles rear their sharp, jagged heads. Seen from a distance, these rocks look harmless enough; for they are not unlike big ships with every stitch of canvas set; but, when quite close to them, one can scarcely repress a shudder at the thought that the biggest ship would have but little chance of escape if once driven on to their sharp, tooth-like edge. A lighthouse warns the mariner from this remorseless piece of coast, and, as we pass, the light-keepers, not accustomed to many visitors, apparently waive their hats to us, and put in motion the machinery that tolls a dismal bell. It is intended as a welcome, but, though all is now brightness and no fog near us, its tones seem to say, "Trust nothing here, but go away." We learn that three light-keepers are kept now, but that formerly two were deemed sufficient until, one stormy winter, when for weeks no boat could go near, the light went out. Days passed before the cause could be learned, but when at length the rocky point was reached, a horrible sight met the eye. One man was dead, and the other mad. It appears that one of the men sickened, and, as no medical aid could be procured from land, he died. His solitary friend watched day after day, hoping for help from shore, but in vain. He durst not throw the body into the sea, for fear he should be suspected of foul play; but the constant presence of the decaying body worked so upon the brain that it could stand no more, and then followed darkness. Poor fellows! it seemed a luxury to shout huzzas to us as we passed. A dreary life, truly. The island is a great geological puzzle at this point, for at Alum Bay, strata of red, dark blue, grey, yellow, and white are tumbled on end, and leaning against the chalk, also on end; but some distance further on, when we get fairly beyond the Needles, the same variegated strata crop up, but this time from under the chalk. Indeed the whole of this side of the island bears unmistakable evidence of a terrible convulsion of nature, and is wild and desolate beyond description. Seen from the sea the land, or rather rock, which is about 700 feet above the sea, looks so steep that it seems impossible to avoid rolling down, down, and still down into the angry waves beneath; but cattle are grazing, and are so absorbed in the difficult problem of finding food on such barren soil, that danger is out of sight. Black Gang Chine is the wildest part of this wild region, but wants to be seen from the land in order to fully appreciate all its ruggedness.

St. Catherine's Point, with its white lighthouse perched high up on the white cliff, is passed, and we are nearing Ventnor. The under-cliff here commences. This is a broad natural terrace, extending from the Point for some miles up to Luccombe Chine, and is apparently caused by a complete slipping away of a portion of the hill above. The effect is extremely peculiar, for high up runs the smooth round hills known as Boniface Downs; so high do they lift their heads that the clouds are hanging like gauze curtains half-way down the sides, veiling but not concealing their tops. Near the base an abrupt jagged edge is apparent, and then there comes comparatively smooth flat ground; on this stand Ventnor and Bonchurch, the houses being built up to the edge and indeed along the sides of the terrace, the paths up to them from the shore being cut into the rocky wall, which has its base in the beach below. We land at Ventnor, and find it the most beautiful spot in the island, with food enough near it to last a photographic cormorant a week at least. The town is very new, so white and clean that we could believe that sand and soap were used on the fronts of all the houses at least once a week.

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[*] Continued from p. 402.

(To be continued.)

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TWO NEW DOUBLE COMBINATIONS OF SULPHOCYANIDE.

BY DR. P. LIESEGANG.

1. *Sulphocyanide of Gold and Ammonium.*—On adding an excess of sulphocyanide of ammonium to a solution of chloride of gold, a red brown precipitate is formed, which dissolves in the fluid, by *slightly* warming and agitating.

The red brown precipitate was dissolved in a mixture of alcohol, ether, and water; upon evaporating it left small dark brown needles, which were pressed between filtering paper and dried over sulphuric acid.

On taking 0·695 grs. of the dried crystals, they left, after long heating in a porcelain crucible, 0·302 grs. of metallic gold in a spongy condition, or 43·453 %. The formula $Au\ (C_2\ NS_2)_3 + NH_4,\ C_2,\ NS_2$, gives 43·946 % of gold.

2. *Sulphocyanide of Silver, and Nitrate of Silver.*—This combination is obtained by dissolving pure sulphocyanide of silver in a hot solution of nitrate of silver. In cooling, white crystal-needles of a beautiful diamond gloss fall to the bottom. A mixture of alcohol and ether can be used to free the salt of the adhering silver solution. The analysis was made in the following manner:—

1.) 0·552 grs. of the salt, washed with alcohol and dried in vacuo, were shaken with distilled water; the precipitate of sulphocyanide of silver was washed and collected on a weighed filter; after drying it gave 0·177 grs. of $Ag\ C_3\ NS_2$, or 32·065 %.

2.) 0·407 grs. were decomposed by very weak nitric acid, and gave 0·131 grs. of $Ag\ C_2\ NS_2$, or 32·187 %. To the filtrate hydrochloric acid was added, in order to determine the nitrate of silver as chloride, and 0·232 grs. of chloride of silver were obtained, which equal 0·2749 grs. of the nitrate, or 67·55 %.

	1	2	Medium.	Calculated.
$Ag\ C_2\ NS_2$	32·065	32·187	32·126	32·806
$Ag\ O,\ NO_5$	...	67·550	67·550	67·194
			99·676	100·000

This leads to the formula:—

$$Ag\ C_2\ NS_2 + 2\ (Ag\ O,\ NO_5).$$

The double salt is entirely disssolved by hot ammonia. On cooling, small tetrahedrons separate from the fluid.—*Photographisches Archiv, March 20th*, 1835.

◆

OLD COLLODION MADE NEW.

BY JOHN R. CLEMONS.*

Another great source of waste among photographers is that of old collodion. It can all be renovated and used again by the following process:—

Pour off the collodion from the sediment, and add subchloride of mercury (Hg_2Cl.)—calomel—until a greenish color is assumed when shaken. Then allow to settle and add more calomel, until, by shaking again, the collodion appears of a canary yellow colour. Now, if it is very old and thin, either add more cotton to it, or mix it with your new collodion. When thus treated, it will never turn red again. If it should not work as sensitive as new collodion, add one drop aq. ammonia to each ounce of collodion, *as you use it.* Should it peel off the negative during development or washing, coat your negatives with

White of eggs (well beaten) ...	1 oz.
Water	6 ,,
Chlor. amm. or sodium	10 ,,

Mix and shake well. After washing the plates, and while wet, coat them with this solution of albumen, and lay them away to dry for future use. The surplus albumen may be kept any length of time in an uncorked wide-mouthed bottle, by adding a few drops of acetic acid. Should the collodion thus treated not dissolve the cotton quick enough, add a small quantity of lime.

◆

PHENOMENA OF DEVELOPMENT.

A New Fact.

BY M. CAREY LEA.*

In the papers which I have recently published on the Phenomena of Development, of which the present forms the third, I have endeavoured to prove, first, that iodide of silver is always sensitive to light, though its sensitiveness varies very greatly according to the conditions imposed, and, secondly, that the invisible image, at least in the ordinary wet process, results from a purely physical change in the sensitive film.

The experiments by which I have essayed to support these views, together with the views themselves, have seemed to me to involve other consequences, especially if my interpretation of these experiments be correct. One of these involved consequences, I have been engaged in submitting to a careful investigation, and I propose here to state the results which I have obtained.

It appeared to me that if the hypothesis that light in the camera alters the film in a purely physical manner only, be correct, and if it be true that the iodide and bromide in the film do not undergo either reduction or other decomposition, but simply acquire a power to attract to themselves the fine particles of a metal that is just ready to be precipitated, there is then *no essential reason to suppose that this power of attraction must necessarily be limited to precipitating particles of silver*, but, on the contrary, the power of attraction might readily be exerted upon other metals. This point I resolved to settle.

There are but very few metals capable of easy precipitation in the reduced state from their aqueous solutions, by the simple action of reducing agents also in solution. Of course, reduction by electro-chemical affinity, or by the electric current, is scarcely here available. No metals, except the so-called noble metals, can be precipitated, for example, by protosulphate of iron, and only some even of those.

Amongst the metals suitable for my purpose, I selected *mercury* as that best adapted, and as the chlorides of mercury are much less easily reduced than the nitrates, I preferred the latter.

I selected, for my experiments, the monobasic protonitrate $Hg_2O,\ NO_5 + 2$ aq. By a few careful trials I found that this substance could be brought into a condition very similar to that of a silver redeveloper. I dissolved pyrogallic acid in water, added acetic acid, and then a few drops of a nearly neutral solution of the mercury salt. If this mixture is properly managed, no immediate precipitation takes place, but the liquid assumes a wine-colour, like that of the silver redeveloper, and remains for a time quite clear. More acetic acid, however, is necessary than with the silver salt.

Experiment I.—A plate was sensitized in the ordinary way, and exposed. It was then placed under a rapid stream of water issuing from a rose, and so arranged that a constant ripple was kept over the face of the plate, which was so left for from five to ten minutes. As the river-water used for this washing contained soluble chlorides in sufficient quantity to become quite cloudy with nitrate of silver, it seemed fair to conclude that at the end of that time, all free nitrate was washed out or decomposed.

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* From the *Philadelphia Photographer*.

* From the *Philadelphia Photographer*.

The plate was then flowed with a nitrate of mercury developer prepared as above described. *The image was thereby clearly developed in all its details.*

Here the presence of any nitrate of silver was carefully excluded, and the agency of the mercury salt in bringing out the latent image was evident and unmistakable. We must, therefore, inevitably admit that the invisible image on the collodion plate is capable of attracting to itself other metallic particles, besides those of silver, and notably those of mercury.

The experiment was repeated a number of times, and always succeeded without difficulty. Not in any one case did the image fail to make its appearence, but always flashed up rapidly and clearly. The exposures in the camera were the same as for the ordinary silver development.

Experiment 2.—For the monobasic protonitrate of mercury, the acid pernitrate was substituted, together with pyrogallic acid. No development followed, a result which was, of course, anticipated in view of the effects of pernitrate of mercury as described in a preceding paper. But as pernitrate of mercury is capable of easy reduction, also, with precipitation of metallic mercury, it was thought advisable to test the question in the manner described.

Experiment 3.—To observe the effect of a longer continued washing than that given in Experiment 1, a plate was prepared in the same way, and was washed forty-five minutes under rapid streams of water issuing from a rose.

An application of the mercury developer produced an image, but a less strong one than in the preceding cases.

Experiment 4.—In order to submit this mercury development to the severest possible test, the following treatment was resorted to.

A plate was sensitized, exposed, and developed with silver in the usual manner, and then well washed. It was next, while still in the dark-room, treated with dilute acid solution of pernitrate of mercury, until the developed image wholly disappeared; it was even left a short time longer than necessary for this purpose, although, under the agency of this solvent, the image disappears with a beauty and regularity that leaves one in no possible doubt as to when the last vestige is gone. Nevertheless, an additional time of immersion was for greater security employed, in order that not the least trace of any reduced metal should be left. The plate was then well washed, and was tried with the mercury developer. With time, a faint, but distinct and unmistakable image came out.

The experiment of the substitution of other salts for the nitrate of silver was extended to other metals, but so far with only negative results.

Gold was tried. From its very easy reduction, gold is difficult to bring into that exact condition of balanced affinities which we want in a developer. The difficulty was overcome by methods not necessary here to detail, and gold was tried in connection with an iron, a gallic, and a pyrogallic development. But no image was in either case brought out, although great pains were taken to obtain it, if it were possible.

Palladium, in the form of nitrate of palladium, which is much more easily reduced than the chloride, and yet not too easily, was tried, and with fair hopes of success, but no picture appeared under its influence.

It is to be remembered, however, that these are to be considered as negative results merely, and not as proving that development may not yet be effected with the aid of these metals.

Those who may desire to repeat these experiments are recommended to first study the bringing of the mercury developer into a proper condition, before proceeding to apply it to a plate. If the mixture turns gray and muddy, it can only be expected to fog.

It should pass slowly into a clear port-wine-coloured solution, which retains its clearness as long as the corresponding silver solution. It is to be remarked, however, that this developer will sometimes, on first mixing, throw down a little gray deposit upon the sides of the glass, and then assume the clear wine-coloured form, in which condition it is fit for use. The deposit of a grayish substance does not take place where silver is used, and it seems proper to point out that its appearence is not necessarily a sufficient reason for rejecting the developer, unless the latter becomes turbid and dirty.

It seems almost superfluous to say that I do not here propose the mercury development as a substitute for the regular one, inasmuch as it would be to take additional trouble to obtain a less successful result. But the demonstration of the fact that silver is not the only substance capable of developing a collodion plate appears to posses an importance which can scarcely be exaggerated. Together with the previous experiments which I have published, it seems to demonstrate pretty conclusively the truth of the theory which ascribes the formation of the image to a simple molecular change, apart from anything like decomposition or reduction.

As to what is the absolute nature of this physical change, that is a problem which still remains to be solved. It is, moreover, one which presents excessive difficulty, because it cannot be decided by direct experiment, but only by inferential deduction. It is a change which the eye cannot detect, and which only becomes apparent to us by the influence which it exercises on the effects of subsequent treatment.

Schnauss's ingenious hypothesis that the physical change was one of peculiar electric tension produced, seems decisively negatived by the experiments published in the second paper of this series (that on the production of a second development upon the same film). For no such condition of electric tension could possibly exist after the treatment by acid nitrate of mercury, and such a physical state must have been completely removed. On the whole, the most probable hypothesis appears to be, that the invisible image depends upon either the crystallization of an amorphous substance, or else some other alteration of crystalline form—a suggestion which I believe I was the first to make*—seems to me to give the most probable hypothesis by which to account for these beautiful phenomena.

Nor can it be said that molecular disturbance is an insufficient cause to which to attribute the power. We have learned to know that changes of molecular condition can affect the colour, the specific gravity, and other physical conditions of bodies. Phipson has lately extended Magnus's researches, and shown that idocrase and other allied minerals lose very strikingly in specific gravity by simply heating and cooling. No decomposition is at the bottom of this, for the constitution of the mineral is unchanged, and at the end of a month it is found to have resumed its old specific gravity—the molecular change effected by the temporary agency of heat, great as that change was, has passed away.

The protiodide of mercury is a well-known instance of molecular structure affecting colour. This iodide, when precipitated, is yellow, but spontaneously changes to scarlet. If this scarlet modification be fused, it forms a yellow mass, but after cooling, returns to the scarlet colour. Pieces that have not changed can be made to do so,by touching with a finger, or with a needle point. Scarlet seems, therefore, to be the normal colour of this salt, and yet, when freshly precipitated it is always yellow, the apparently abnormal colour.

Mercury is a metal nearly allied to silver, and I have never doubted that these remarkable properties of iodide of mercury were connected, or, in some way, corresponded with those of iodide of silver, and that when our knowledge is more complete, one of these may give us a key to aid in explaining the other. It would be exceedingly interesting to observe whether *light* has not also something to do with these changes of colour. Whether, for example, the precipitated yellow iodide would acquire the scarlet colour in the dark, and whether this would happen with the fused yellow iodide. These questions appear to possess the greatest interest in connection with theoretical photography. I propose at a later time to submit them to careful experiment.

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* *Humphreys Journal*, vol. xvii, p. 21.

A few words upon the nitrates of mercury, upon which so much in this and the preceding paper depends, may not be out of place.

To obtain the nitrates of mercury in a state of purity demands some circumspection. The monobasic protonitrate of mercury has a strong tendency, for example, when left in contact with excess of metallic mercury, to pass into sesquibasic salt, and yet it is necessary that mercury be present in excess to avoid the formation of per-salt.

Cold dilute nitric acid is to be placed in contact with excess of metallic mercury. When short prismatic crystals are formed, the solution is to be poured off and left to crystallize by evaporation at ordinary temperatures, and without application of heat. To obtain a clear solution of these crystals, it is necessary that a little acid in excess be present, at least this is necessary to prevent a precipitation by diluting. It seems not impossible that the salt in question then passes into acid protonitrate, at least in part. This slight acidity does not interfere with the properties described above. I think it is even quite probable that the "acid protonitrate of mercury" of the shops would be found to develop the image, but I have experimented only with the salt prepared as above described, by myself. The constitution of this monobasic salt is given by C. G. Mitscherlich as Hg_2O, NO_5+2 aq.

The acid pernitrate of mercury is most easily obtained in a pure state, by dissolving red oxide of mercury in nitric acid. When so formed, it cannot contain proto-salt. It may also be obtained by boiling metallic mercury with excess of nitric acid.

When free from proto-salt, it gives no precipitate of calomel as a white powder, by adding solution of common salt. A strong solution of pernitrate, nearly neutral, will give a yellow precipitate of terbasic salt by dilution with water. For the purpose of dissolving the image, the more strongly acid solution which remains by filtering off from the yellow terbasic salt, is very suitable. It is quite probable that the acid nitrate of mercury of the shops would be found to answer, but as in the former case, I have used only that which I prepared myself.

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IDENTITY IN PRINCIPLE OF THE COLLODION PROCESS AND THE DAGUERREOTYPE.

BY M. CAREY LEA.[*]

Before proceeding to the facts which I expect to develop in the concluding paper of this series on the properties of iodide and bromide of silver, I propose to consider some consequences which flow from my experiments upon the mercurial development of the wet collodion film.

The deduction to which I propose here to refer, and which is but a single one of many which may be drawn from this new fact, is the complete identity which exists between the two great branches of photography—the Daguerreotype, or production of a positive image on metal, and the various forms of Talbot's discovery, the development of a latent image in the wet way, by gallic or pyrogallic acid, or by the later variation of development by iron.

The mercurial development of the wet plate which I have discovered brings together these two forms of photography in a very remarkable manner. It shows us that the capacity for development by a silver developer is, after all, precisely the same thing as the capacity for development by mercury. *That whether the attracted metal be silver, mercury, or any other; whether it be presented to the latent image as a rising vapour, or as a descending precipitate, the agency at work is identical.*

In a word, I believe I have thus brought these two forms of development under one law; have shown that they are dependent upon a single principle, and are, in fact, merely two manifestations of a single phenomenon.

And I do not, in the least, doubt that by a series of careful experiments and delicate manipulations, we might take an impressed Daguerreotype plate, and develop the image in the moist way, as with a collodion film. And that, similarly, we might take a dry collodion film, and bring out the invisible picture by vapour of mercury. But whether or not this can be effected (its failure would only be ascribable to mechanical difficulties), the fact appears to be demonstrated that the Talbotype in all its forms, whether its support be glass, paper, or metal, its vehicle collodion, albumen, or other substance, and the Daguerreotype, are but variations of a single experiment. And in bringing these two processes, apparently so widely separated, to a common principle and a unity of source, we advance immensely towards a simplification of our facts, and towards a comprehension of the theory on which they depend.

Nor is this by any means all. The fact that these two forms of photography are identical in principle, and differ only in the detail of development, naturally leads us to the reflection, that as the latent image is now shown to be developable in three classes of ways, 1st, by vapour of mercury, 2nd, by a silver solution ready to let fall its silver, and 3rd, by a solution of mercury in a similar condition,[*] and as it now becomes clear that development is not a matter of chemical affinity, but one of molecular attraction, so we are naturally led to the reflection that it is highly improbable *that these methods of development are all that are possible*, but that, on the contrary, other modes of development, perfectly distinct from these, and dissimilar from them, may exist. The field here opened for experiment is a large, inviting, and promising one, and the prosecution of further research in this direction may lead to most important results, both as respects theoretical principles and practical photography.

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EXPERIENCE DERIVED FROM EXPERIMENTS WITH THE TANNIN PROCESS.

BY PROF. TOWLER.[†]

We prefer coating the plates with a solution of albumen or india-rubber to simply varnishing the edges with these solutions, because there is more room for carelessness, inadvertency, or accident. From numerous experiments, thus forming experience, success is more certain with the former method than with the latter.

For taking photographs of public buildings, streets, &c., the dry tannin process is more convenient than the wet process for a *practical* photographer, because it is equally reliable and entails *much less* trouble. A dry plate can be prepared almost as readily and quickly as a wet plate, for it may be dried by artificial heat. It is then sensitive, and will remain so for weeks, months, &c. With a dry plate there is no cause for hurry, impatience or bustle. The practical photographer, therefore, needs no tent or wheels, no transportation of his laboratory to the opposite side of his village in order to take Squire N——'s mansion or Miss L——'s boudoir; he requires simply a couple of dry tannin plates prepared during the evenings and kept in readiness. A box is easily constructed like the old daguerrean plate-boxes for holding half-a-dozen dry plates or more; and Squire N—— or Miss L—— will allow you to retire under the staircase to make the requisite change of an exposed plate for a new plate. The developing and fixing are operations for the evening.

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[*] From the *Philadelphia Photographer*.

[*] I do not wish to be understood as asserting that these three classes *rigorously* include all known methods of development, but I propose to consider this part of the subject more particularly hereafter.

[†] From *Humphrey's Journal*.

A lens whose principal focus is about three inches, and made by any of our reliable opticians, will take, by the wet process, a negative of a landscape in four seconds, in bright sunlight. There are scenes, however, in deep glens, that will require an exposure of as many minutes. With the dry process and an alkaline developer, the same lens will require an exposure in the former instance of at least twenty seconds, and over thirty or forty where there is much foliage. The minimum difference is thus five times as long an exposure for the dry process as for the wet process. Twenty minutes' exposure in the latter case, that is, in the glen would certainly be required.

Many persons have not succeeded with the dry process in taking photographs in dark and narrow ravines; they were in the habit of exposing their plates three or four minutes—the reason of their failure is self-evident. Had they exposed their plates at least a quarter of an hour, but still better, half an hour, they would probably have succeeded.

The development of a dry plate is more within control than that of a wet plate: over-exposure of dry plates, therefore, is rather a virtue than a vice. Under-exposure is *never* to be recommended, because, if the actinic impression has not been made, the picture cannot be made to appear by any developer.

It will be seen that the wet process has its advantages over the dry process in dark and deep ravines, thickly wooded with pines, owing to the inconveniently long exposures; this, perhaps, is the only inconvenience.

We have lately prepared tannin plates that were exceedingly sensitive, but lacked in intensity. The plates underwent the usual routine of manipulation, until they were finally coated with tannin and washed: they were then flowed with an alkaline solution containing two grains of carbonate of ammonia to the ounce of water. The plate was again rinsed and flowed, either now or just before development, with a dilute solution of acetic acid, four drops of the ordinary acid to the ounce of water. The plates are thus rendered very sensitive; but we have failed to obtain the desired intensity with the acid developer as we expected. Further experiments will probably elicit a concise method of preparing sensitive tannin plates. An alkali evidently is instrumental in producing sensitiveness; and it appears probable that sensitive wet tannin plates may thus be prepared. Cannot some of our friends prosecute the investigation by the method suggested.

We regard the alkaline developer, with the recent modifications and the preparation of the tannin plate, quite as reliable as the acid developer. The time of exposure for a plate to be developed by an alkali is much shorter than by an acid. The acid developer requires at least, we think, four times the length of exposure of the alkaline developer; but the latter is apt sometimes to produce a foggy film, whilst the former is in direct opposition to fogginess by reason of the citric acid in readiness for this purpose. With proper management the alkaline developer ought to produce no fogginess. We shall recur to this subject on another occasion.

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PAPER FOR PRINTS AND PHOTOGRAPHS.

"Proofs on India paper," at four or five times the price of ordinary impressions, used to be sold—and may now be—when very choice engravings were made. The most noticeable characteristic of this paper was its warm colour. Next to India paper, in the estimation of engravers, stood French paper; and this had a warmer colour than English or American paper. There were other qualities in which they differed; but, in our opinion, the sole cause of preference was the colour; for the French paper took the ink as well as the Indian and made as clear an impression. Let us consider these papers with a view to improvement; and to begin with, let us consider common drawing paper. When you buy it, it is white; when your drawing is done it is rather yellow; in two years it is brown. If you have used colours upon it they have lost their harmony because of the change of the colour of the paper. But how came the paper to be white? Its material was bleached, and vitiated with chemicals, and bleached again. But the India paper was made of unbleached material and unrotted material. Now let us look at the barbarous preparation of our flax, from which our best paper is made. First it is rotted; and in this process the fibre is darkened. It is then bleached; and in this process it is further rotted. Comparing the colour of it with that of Sisal hemp, which is not rotted, but separated from the bark while it is green and fresh, we see a contrast that should lead us to a reconsideration of our time honoured-process. At least we might take a ton of green flax for trial; and separate the fibre without the rotting process. Then we might dispense with the bleaching, to see what tint of paper we could get, and how long that tint would endure without change. So we might take raw cotton, unbleached and unrotted, and make paper of it. Neither would have that whiteness which makes common paper inferior to Indian, in the estimation of engravers and connoisseurs; but what would be the colour after a few year's exposure to light? We think it would be much better in the unbleached than in the bleached papers.

As to strength there can be little doubt; bleaching generally, if not always, impairs the strength of fibres. It is a bad practice, to satisfy, not taste, but a prejudice. Real taste, as in the artists and connoisseurs, prefers the natural warm hue; and only a prejudice, arising from associations, prefers the pure white and tolerates no varieties. It is a humbug that is not free from cheating, because it actually damages the fabric as to strength, and because there is a tendency to return to the natural colour, at the expense of the harmony of the drawing, if it is in colours.

Paper for artists, for good mechanical drawings, and for bank notes, ought never to be made of old rags that have been contaminated with bad soap and alkalies and bad bleaching. New materials, such as unrotted flax and unbleached cotton should be used. Perhaps cotton is wholly inadmissible into paper for such uses, but this is yet a question.

If these views are correct, then we want a machine to extricate the fibre from green flax; for we cannot pound it out by hand as Sisal hemp is got out. Here is a job for inventors; by which they may make money, as well as benefit the world, if they get good speculators to help them, and look out that the speculators do not get more than their just share. It may also be well to look out that the speculators either have some capital, or have the confidence of some capitalists. These considerations, however, may be left until the chicken is hatched.—*American Artisan.*

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Correspondence.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

Sir,—Being desirous of joining the Amateur Photographic Association, I intended yesterday writing to the honorary secretary for copy of rules, &c., when, on perusing your valuable Paper of 25th inst., I perceived the communication of a "Member" respecting the irregularities connected with the proceedings, which are totally at variance with the rules. For a resident in the country, such as myself, it would be impossible to attend the meetings, but I certainly understood from the announcements of the advantages, &c., in the Year Book and Photographic News, that the interchange of the "many thousands of valuable negatives now buried in the plate boxes of amateurs" might be effected; but from the letter of your correspondent of Friday last it appears that such interchange does not take place, and the "advantages" are doubtful. Such a subject as this is important to the amateurs at large, and if it is not immediately explained by the honorary secretary, it will be taken for granted by myself, and other gentlemen amateurs on whose behalf I write, that the "advantages" of the Association are unworthy of being considered, and myself and friends will consequently refrain from joining the Association. Trusting that the importance of the subject will excuse the length of my communication,—I remain, &c., &c., A Subscriber.

PHOTO-BINOGRAPHY.

Sir,—In your editorial remarks of the 11th inst. you acknowledge that the test I offer in proof of the existence of binocular relief in a binographic portrait is a satisfactory one; yet you immediately propose to substitute for it a different kind of test.

The question at issue has no reference at all to a picture of several objects placed in different planes, and I therefore respectfully decline to enter into another idea until the one on hand has been disposed of. In the meantime, I shall be glad if you will use your influence with Professor Wheatstone to induce him to accept, in the interests of a profession which you so fairly and so ably represent, the office of referee, and, on his acquiescence becoming known to me, I will at once take action to prove practically, and without a chance of future cavil, that binography is not only new, but true and useful.—I am, sir, yours respectfully,

Edwin Pettitt.

[We did not propose to substitute a different kind of test, but such an extension of the test proposed as should place the matter beyond cavil. We have written to Professor Wheatstone, and sent him the necessary documents. On hearing from him we will communicate with our correspondent.—Ed.]

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Photographic Notes and Queries.

Mr. Robinson's "Autumn."

Sir,—As my opinion differs so widely from your own, I must be content to submit to the indirect abuse I received in your last; but with all due deference to such self-constituted authorities in art as editors of photographic journals, permit me to say, in reply, that a scene may be from nature without resembling nature even when photographed, and that the incongruous association of dried sticks and dead plants formally arranged by hand is what I meant in using the word "artificial." Permit me also to re-assert that the figures in the above-named picture are *not* all in the same light; the heavy mass of dark which, for some strange reason of your own, you consider "necessary" to the composition, being as unlike the delicate shadow a cloud casts over the landscape on a sunny day as it well could be, while, from variations in the time of exposure, a varying and contradictory effect of light exists in those parts of the picture printed from different negatives. If you ask a botanist how ferns grow, and then look at the "Autumn," I think your opinion will be changed. Surely, a mistaken estimate of a picture may be pointed out to your readers without being followed by an accusation of prejudice and dishonesty; if not, when I next desire to point out errors calculated to mislead and misinform photographic art-students, I must seek a more impartial medium than can be found in your pages.

I am afraid a false jealous feeling, calculated to breed dissension between artists and photographers, is being fostered by photographic journalists, and I regret this the more because, as a rule, photographs are warmly appreciated and admired by the great body of artists and art-students. I am, sir, yours respectfully, An Artist.

[Our correspondent has some odd notions of the nature of abuse, of the value of opinions, and of what it is to be "self-constituted authorities in art," &c. He stated not simply his own opinion, which would have been of no importance, but also that the "Autumn" was made up of "artificial scraps." This we knew to be untrue, having seen, not only the negatives, but the scenes from which they were produced; and we stated the facts. This our correspondent calls "abuse." He, moreover, notwithstanding our statement of facts that we know, repeats his insinuation as to artificial scraps, by stating that the picture contains an "incongruous association of dried sticks and dead plants formally arranged by hand." This statement, we have simply to repeat, is, to our knowledge, untrue. Our correspondent, whom we know to be ignorant of botany, requests us to ask a botanist how ferns grow. In this case such a step is unnecessary, as we saw the ferns growing where they are depicted in the photograph, and have seen ferns growing in similar situations scores of times. There are no dead plants, that we know of, in the picture, certainly none arranged by hand, formally or otherwise. Our columns are always open to opinions modestly expressed, but it is our duty, which we always to the best of our ability perform, to correct misstatements, and it does not concern us that our correspondent will in future seek an organ in which he can state facts erroneously, without editorial correction. As to opinions on the naturalness of a picture photographed from nature, or on effects of lighting, we enter into no discussion. We here simply deal with facts. Our opinions on this individual picture have been stated before, and remain unchanged. On the self-constituted character of the authority of an editor, "An Artist" talks sheer nonsense. The editor of a photographic journal holds a position in which he is responsible to a large constituency; if he blunder, his authority will soon cease to have weight. An anonymous correspondent expressing his opinions in oracular tones, on what he deems a mistaken estimate, is indeed a self-constituted authority, without credentials of any kind for his opinions, which just pass for what they are intrinsically worth. We invite our readers to form their estimate of those of "An Artist" by a personal examination of the picture on which he has given his opinion, and which is now exhibited in the Agricultural Hall. As to the supposed feeling of jealousy between "artists" (we presume our correspondent means painters) and photographers, which photographic journals are alleged to foster, we need only remark that, as our readers well know, we have ever held that the real artist of any capacity was one of the greatest admirers of the real beauties of photography. The detractors are confined to fifth-rate artists and small art-critics.—Ed.]

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Talk in the Studio.

Dr. Vogel's Theory of the Decomposition of Iodide of Silver by Light.—We learn from a private letter, just received from Dr. Vogel, that our conjectures last week, as to his non-familiarity with the views of M. Poitevin on this subject, were correct. Dr. Vogel informs us that he had seen M. Poitevin's paper communicated to the French Society in 1862, but only in German translation, and although he now sees a similarity in certain phrases on comparing them with his own, he really had not derived his idea from it, the paper not being, indeed, in the dress in which he found it, sufficiently intelligible. He remarks, moreover, that whilst M. Poitevin stated mere hypothesis, he stated facts and detailed experiments. M. Poitevin had stated that reducing agents, such as tannin, gallic acid, &c., acted as sensitizers; Dr. Vogel demonstrated that nitrate of silver acted as a sensitizer, not because it was a reducing agent, but in virtue of its energetic absorption of iodine. Dr. Vogel also laid especial stress on his explanation of the difference between bodies decomposed directly by light, such as chloride of silver, bodies like iodide of silver only capable of being reduced by light in the presence of a body capable of combining with one of the liberated elements, a fact before certainly not demonstrated or recognized.

Release of Mr. Moens.—Mr. Moens, the photographer who was captured by the brigands, is released. The first intimation of a probable improvement in his position was in a recent number of the *Nazione*, which said that Mr. Moens, now three months a prisoner in the hands of the brigands in this part of the country, has been carried off by five of his captors, and thus removed from the larger portion of the band. Nothing has since been heard of them. A quarrel among the ruffians was the cause of this separation. The five who have gone off from the rest always maintained that Moens should not be set at liberty for the price agreed, but that a much larger sum should be asked. General Pallavicino, on being telegraphed to on the subject, replied that this split was favourable to Moens, and that his friends might rest assured of his being soon restored to them. The matter does not sleep, but is uppermost in the thoughts of all, commencing with Madame La Marmora, who is an English lady, down to the humblest employé. A few days later it was announced that he was liberated on payment of a ransom of 30,000 ducats, or about £6,750 sterling. The *Standard* says, regarding the payment of a ransom:—"We trust this affair will prove a warning to gentlemen who, in search of the picturesque, roam into quarters surrounded with known dangers, from which they can only be rescued by a pecuniary sacrifice so large. Hereafter, they may rely upon it that the wandering Englishman will offer a more tempting bait to the free foresters of Italy than an archbishop, or even the Pope himself, if he happened to stroll their way." The *Telegraph* is virtuously indignant that brigandage has been practically encouraged by the payment of a ransom. It remarks:—"We suspect that English travellers in the southern part of the peninsula will have cause to regret the success which seems to have attended the extortion of the banditti. If the brigands on the frontier land between Rome and Naples once know that the ransom of English captives will be allowed, while that of Italians will not, we shall be subjected to the special vigilance and attention of these land pirates." The friends of Mr. Moens, very naturally, were more concerned to release one captive than to check the capture of many more; and if the payment of English gold encourage the capture of Englishmen, possibly it may be found that English metal of another kind may have some influence on the destruction of brigandage, which, under any plea, is a disgrace to the Government of Italy.

Collodio-Bromide of Silver and Collodio-Chloride of Silver.—At a meeting of the Liverpool Amateur Photographic Association, held 29th August, a paper by Mr. Sayce, entitled "Manipulation of Collodio-Bromide of Silver," was read by the President, Mr. Sayce being unavoidably absent; after which details of the process underwent considerable animated criticism, the general opinion, derived from the illustrations exhibited, being that the process is not in any way inferior to any of those where a bath is employed, but, in consequence of possessing advantages peculiar to itself, it might be regarded in some respects as superior. This opinion was further confirmed by comparison of two negatives of a scene near Corwen, one a collodio-bromide plate, the other a plate prepared with a bath by a member of the Association, both plates being exposed on the same day and at the same time. Several prints and negatives, by Mr. Sayce, Mr. Bolton, and Mr. Phipps, were exhibited, and elicited general approval. Mr. G. F. Williams made a few remarks in favour of printing with collodio-chloride of silver, and passed round for inspection prints by that method, which were examined with interest. Mr. Williams had found the toning-baths of acetate of soda and chloride of gold, or sulphocyanide of gold, to answer perfectly. The details of Mr. Sayce's paper appeared in the Photographic News o June 30th.

Dublin Exhibition.—The jurors in the photographic department have, we understand, completed their awards, the details of which, with report, will shortly be published.

Photography and Forgery.—Two Frenchmen were recently charged before Mr. Knox, at Marlborough Street Police Court, with forging Russian bank-notes. Photography, it appeared, had been made use of in transferring *facsimiles* to the plates for engraving.

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To Correspondents.

⁂ To CORRESPONDENTS, AGENTS, and ADVERTISERS.—REMOVAL.—On and after the 15th of September, the Photographic News will be published by Mr. Piper, at 15 and 16, Gough Square, Fleet Street. The Proprietors have found it necessary, for the satisfactory transaction of business, to remove their printing and publishing offices to larger and more convenient premises at the above address. Gough Square is entered from Fleet Street by Bolt Court and Wine Office Court. Communications for the Publisher should be addressed to Mr. T. Piper; for the Advertising Department, to Mr. Dring; and for the Editorial Department, to the Editor, 15 and 16, Gough Square, Fleet Street, E.C.

J. H., and other Correspondents.—The address of Mr. Sayce is 17, South Castle Street, Liverpool.

H. Rogerson.—With the acetate toning bath and good negatives you can easily obtain the rich warm tone to which you refer. We believe the acetate toning bath is used by the gentleman you mention.

T. K.—The organic iron developer is especially intended for negatives, and is not well suited for positives in which you require a deposit of pure metallic silver as white and pure as possible, whereas the organic developer tends to give a brownish deposit. A developer containing nitric acid, or indeed one of nitrate of iron, will give the best positives. You will generally obtain your positive collodion best ready mixed by the maker. You add too much iodide of potassium in making your bath.

Light and Shade.—We described the organic developer as Mr. Hughes gave the details, and as we tried it with success. You may, if you choose, try the double sulphate in the same way. See an article in the present number by Mr. Nelson K. Cherrill. 2. We do not know any triplet by Vogel, and cannot, therefore, give any opinion of it. 3. The examples of your work enclosed possess many excellent qualities and have much promise. The lighting, chemical conditions, printing, and manipulation generally are all good. The chief point in which there is room for improvement is in the artistic treatment. You must study the principles of composition, so as to be able to judge why a certain arrangement of lines or of light and shadow in a picture is good or bad. Nos. 2 and 6 are the best we have received. No. 1 is not bad, but might have been a little more graceful. No. 3 is rather commonplace and awkward in arrangement. No. 4 may be permitted to pass as a careless position; but it contains a violation of what Mr. Ruskin would call *function* in art. A davenport, or writing-desk, is not intended for anyone to sit on. No. 5 wants something to balance the picture behind the figure, and the position is stiff. Whilst we have criticized the art qualities of some of the pictures freely, we may state that as a whole they are far above the average, and in technical photographic qualities are excellent. You appear to have set about your work in the right manner, and will, we doubt not, attain to high success. Let us hear again from you.

R. Tudor Williams.—The letter has been forwarded. We shall have pleasure in receiving the pictures to which you refer.

Rev. W. J. J. Welch.—The 10 per cent. salting solution mentioned in Dr. Van Monckhoven's paper can only be understood literally as one ounce of the salt in ten ounces of water. This appears to us to be unusually and unnecessarily strong, but we have not seen or heard of any correction or explanation having been made by Dr. Van Monckhoven, who is, we know, a reader of the News. Chloride of ammonium will doubtless answer. It will be best to try the formula as given. One gramme is about 15½ grains. One litre 35 ounces. Ten cubic centimetres about 2 fluid drachms and 40 minims.

R. A.—The lens about which you enquire (No. 1) is the best in every way which we know for the purpose. The best of No. 2 is also good, the others are inferior. No. 7 is good, but not so good or so rapid as No. 1. The card you enclose has many very excellent qualities.

J. H. Ritchie, Jun.—The letter was duly forwarded. We shall be glad to hear details of your experiences with the process.

David Wardlaw.—The term *drop* in the article refers to a stock solution described on a former occasion. The great point in toning collodio-chloride pictures on opal glass is to use the toning solution weak and old. 2. It is very probable that with some samples of gelatine a less proportion may be used with advantage. Heat may be applied to facilitate solution. 3. In printing on opal glass, a special printing frame should be used, which permits the progress of printing to be examined without danger of moving. There are several modes of contriving this with ordinary printing frames, which would occupy too much space to enter into detail here. Sometimes it is easy to guess the time by observing when the bronzing commences on the deepest shadows.

Tyro.—To enter into a satisfactory consideration of your questions would require much more space than we could afford in this column, even if the subject were photographic. Our contemporaries, the *Scientific Review*, *Engineer*, or the *Mechanic's Magazine* would, however, more properly deal with your enquiries. We may also mention that you will find a good deal of information on some of the subjects of your enquiries in Dr. Golding Bird's "Natural Philosophy." The apparatus, a sketch of which you enclose, was originated, we believe, by Dr. Bachoffner.

G. Garnett.—We will forward the parcel with comments.

Argentometea.—The strength of the printing-bath must depend on the preparation of the paper. With a weakly-salted paper, such as most manufacturers now send out, a 40-grain bath will be sufficient; with other samples a bath of 60 grains or more must be used. 2. We do not quite understand what you mean by a print giving brown and red during exposure. Such irregularities are generally the result of some accident. 3. We use one ounce of hyposulphite in five ounces of water for albumenized prints, and immerse about a quarter of an hour.

F. L. M.—Mr. Sayce finds that with a weak solution of tannin he obtains more softness, and with a strong solution more vigour and contrast. This is in accordance with the experience of Major Russell. The exposure is about half that of the ordinary tannin process.

A. B.—We cannot give you a formula for the preparation of German yeast.

J. P. Green.—The example of a phantom duplicate of the image appearing just beside the sitter is very singular. Are you quite sure that it did not arise from some accidental movement of the camera just as you were replacing the cap of the lens?

J. E. Gaiswold.—Thanks; the matter shall have our careful attention.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. A. Wyatt, Fareham,
Photograph of Place House, Catisfield.
Two Photographs of Porchester, from the Keep of Porchester Castle.

Mr. James Walker, Regent House, Doncaster,
Four Photographs of Edmund Denison, Esq., of Doncaster.

THE PHOTOGRAPHIC NEWS.

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THE ACTION OF LIGHT IN FORMING THE LATENT PHOTOGRAPHIC IMAGE.

There are few theoretical subjects connected with photography upon which so much has been written and so little decided as the nature of the latent image, and the mode in which light acts in producing this image. The two theories which have been maintained are:—the physical theory, which supposes that the action of light causes a molecular disturbance in the atoms of the sensitive salts, or bromo-iodide of silver, which enables them to facilitate the reduction upon themselves of a metallic vapour in the Daguerreotype process, or a solution of a metallic salt in the wet collodion process; and the chemical theory, which supposes that absolute reduction or decomposition of the sensitive salts is effected or commenced by the action of light. Both these theories have adherents, and in support of both a number of facts are adduced. By far the most interesting and able papers which have been written in favour of the physical theory are those of Mr. Carey Lea, which have been recently reproduced in our columns. His experiments have been new and ingenious, and his arguments persuasive, whilst in many other hands the same theory has been supported by fallacious facts and inconsequent arguments. It is not our intention to enter into any review of the whole subject, but simply to mention one or two facts, bearing on the question, which appear to have been either overlooked, or not duly weighed; and to suggest that whilst many of the facts supporting the chemical theory cannot be explained on the physical hypothesis, the facts supporting the physical theory may be either explained as the result of chemical action, or, for the present, without impropriety, entered on the long catalogue of unexplained details connected with photographic phenomena.*

In considering the action of light in producing the invisible image on iodide or bromo-iodide of silver, and the nature of development, the Daguerreotype undoubtedly furnishes the least complicated phenomena. At the same time we may fairly assume, from the variety of evidence to that effect, that although in various other processes more elaborate operations take place, because a greater number of agents are involved in the change, yet the principles are identical, and that the operation of light in producing the latent image in the Daguerreotype is similar to that by which the latent image is produced in the wet and dry collodion processes. If the action of light on the Daguerrean plate be physical, it is so in more complicated processes, and if it be chemical in one case, it is in all.

It is urged then, by the adherents of the physical theory, that the Daguerreotype image is really formed by the mercury deposited in vapour upon those parts of the iodized plate which, in virtue of a molecular derangement, have acquired the power of attracting the vapour, or permitting it to deposit.

But before admitting this theory, there are certain facts to be disposed of which, in our estimation, are conclusive evidence of the chemical nature of the change, and that an actual decomposition, although invisible to our eyes, is actually set up by the first impact of light, and which is completed by light if time be allowed.

In the first place, a film of pure iodide of silver on a silver plate, without the presence of any organic salt or reducing agent, will, on sufficient exposure in the camera, yield a distinct image, different in colour, it is true, to the mercury-developed image, but answering in every gradation to the action of the light.

In the second place, a film of pure iodide of silver on a silver plate, without the presence of any reducing agent, will, after receiving a latent image in the camera, yield a visible image on further exposure to light under a piece of red or orange glass. Various theories have been formed to explain this. M. Becquerel, to whom the discovery of the fact is due, supposed the existence of what he termed "exciting rays and continuating rays," the red and yellow rays having, in his view, the power to continue an action set up by the blue rays. Others supposed that it might be the calorific power of the red rays which exercised a developing action. Apar from theories, here is the simple fact that light sets up and continues an action on pure iodide of silver which results in a visible image. It appears to us probable that this decomposition, once set up by strong white light, is probably continued by a portion of white light passing through the coloured glasses, but which is too feeble to overcome the *vis inertiæ*, and commence decomposition on the parts which had before been protected from white light.

In the third place, the latent image formed by light on a Daguerreotype plate can be developed without the deposition of any metal in vapour or otherwise, but by the application of a reducing agent, capable of completing the decomposition already commenced. The fact we are about to mention is one which is, we believe, but little known amongst investigators of these phenomena. It very satisfactorily establishes the analogy between the method of development in the Daguerreotype and in the collodion process. In the May of 1853 we were present at the meeting of the Society of Arts when the Rev. W. Towler Kingsley read a paper on the application of the microscope to photography. At the conclusion of his paper, in which he had put forth his views relative to the nature of the Daguerrean image, Mr. Kingsley performed a confirmatory experiment; he produced a Daguerreotype plate which had been exposed in the camera, and contained a latent image, and poured over it a solution of pyrogallic acid, which at once developed the image in all its detail. Of this operation, which we had the good fortune to witness, the record is but meagre, the experiment being incidental and not especially bearing on the main purpose of the discussion. Mr. Kingsley is reported to have said that "he had merely performed the experiment in question for the purpose of showing that the development of the image on a Daguerreotype plate did not depend, as some supposed, on the precipitation of mercury on its face. The agent he had used for that purpose was merely a solution of common pyrogallic acid."[*] Mr. Kingsley expresses in his paper a conviction that the image is not developed by the deposition of mercury, but by the affinity which the vapour of mercury has for iodine, which thus carries on the further reduction of the iodide which light has commenced; and he further states that paper pictures may be developed by means of the fumes of mercury in the same way as Daguerreotypes.

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* "In the great majority of researches the philosopher meets with obstacles, which the whole sum of his scientific knowledge, as well as the most acute reasoning power, cannot overcome. These, then, are new facts or phenomena appertaining to unknown laws, and not accessible to reason for want of the intermediate links for a conclusion."—*Baron Leibig.*

It has been contended that, because the finest tests have failed to show any trace of liberated iodine, no decomposition could have taken place.[†] Mr. Hunt accounts for this on the ground that the iodine, liberated by the decomposition of the iodide of silver, at once attacks the layer of silver underneath it, forming a fresh layer of iodide of silver; and he states that, on rubbing an exposed Daguerreotype plate with the finger, a fine metallic powder, consisting of metallic silver, but with no trace of iodine, was removed, and a sensitive surface of iodide of silver found underneath. The longer the time the plate was exposed, the greater the quantity of silver in powder thus produced by the decomposition, and the greater the depth of abrasion into the plate by its removal; and eight surfaces of silver in powder might be removed, and a sensitive surface of iodide of silver still be found underneath.[‡] It is well known that the presence of free iodine in the camera would render the Daguerreotype plate quite insensitive, and that free iodine would restore the sensitiveness of an exposed plate, the iodide decomposed by light being reconverted into iodide of silver by the fresh iodine.

Mr. Hardwich argues that, if the action of light in forming a latent image did really produce any decomposition similar to that of the developer, shortness of exposure ought to be easily compensated by energy or prolongation of development, which, he states, is not found to be the case. The argument is a good one, but the facts are really in opposition to Mr. Hardwich's conjecture. Even in the wet collodion process, extra energy of development, or its protracted operation, often does materially compensate for short exposure; but there are causes which come into operation to prevent lack in one operation being compensated altogether by excess in another. In the Daguerreotype process, however, there are cases in which imperfect action of light is well made up by the continued action of the developer. In our own experience we remember one especial case. A Daguerreotype plate, having been exposed very late in the evening, was submitted to the fumes of heated mercury in the usual way. On examining it after the proper lapse of time for development, there was scarcely any trace of an image present, a slight indication of the existence of some high lights only being apparent. Being in haste to attend to something else, we just put the plate back over the mercury as the most easy mode of disposing of it for the moment, and, putting out the spirit lamp, we left it. On removing the plate next morning, for the purpose of putting it amongst dirty plates, we found, to our surprise, a very beautiful picture, charmingly full of detail and roundness. About eighteen hours of exposure to the action of mercury, slightly vapourized at the temperature of the atmosphere, served to bring fully out an image which had received such an insufficient exposure as to yield no picture at all with the ordinary treatment of development.

It appears to us that the facts we have mentioned in reference to the Daguerreotype are utterly inexplicable on the physical theory, whilst they are perfectly consistent with the theory of Dr. Vogel and of M. Poitevin, that pure iodide of silver is decomposed by light in the presence of a substance which readily combines with iodine. Mr. Kingsley's experiment established the identity between the development of the Daguerreotype plate and the calotype paper and collodion film. In our own experiments some years ago we developed perfectly-washed films of bromo-iodide of silver with a solution of plain pyrogallic acid[*] without any free nitrate whatever. This circumstance, although militating against the physical theory, Mr. Carey Lea, with the candour which marks his writings, mentions, and, with the precision which marks his experiments, verifies. Major Russell obtains, on plates prepared with bromide of silver and tannin, not merely phantom images, but intense negatives, the image being reduced solely from the bromide without any free nitrate in the developer whatever. The fact that after development and before fixing this image may be dissolved with nitric acid, leaving around it untouched, the bromide of silver, simply carries the proof that the image consists of metallic silver, reduced from the bromide of the metal, a step further, and makes assurance doubly sure. These facts appear to us unexplained by the physical theory.

The chemical theory, which supposes that iodide of silver is decomposed by light in the presence of a body which readily absorbs iodine, is confirmed by many of the facts of the wet collodion process. In the ordinary operations free nitrate of silver is present to perform this office; but if the plate be thoroughly washed it is much less sensitive, and requires a long exposure, no matter how it may be developed. There is only present to combine with the iodine small traces of bromine, if a bromo-iodized collodion were employed, or chlorine if a chloride were used to decompose the last traces of free nitrate.

The most striking of the experiments made by Mr. Carey Lea in support of the physical theory are those (see ante, p. 380) in which, after developing an image on a bromo-iodized film, it was, without fixing, submitted to the action of a solution of pernitrate of mercury, which, dissolving the reduced silver, removed the image. The film of bromo-iodide of silver was then washed and examined, and presented to the eye no apparent change. From this it is argued that the image had been formed *entirely* by the free nitrate of silver in the developer, reduced by the developer on certain parts of the film in virtue of a physical change in those parts which had given them the power to attract or assist reduction. It is argued that if any portion of the bromo-iodide of silver in this film had been reduced, and removed by the pernitrate of mercury in dissolving the image, corresponding depressions in the plate would have been apparent. But this is, we think, assuming too much. It is assumed that in forming a latent image a sufficient portion of the bromo-iodide of silver is reduced to be appreciable to the human eye. We can conceive it very possible that in the exposure of a wet plate an infinitesimally small portion of the surface of the sensitive film is acted on and partially decomposed by light, and that a large portion of the image is formed by the free nitrate in the developer. Indeed, we know that this is the case, for the image produced by developing without free nitrate a perfectly washed plate is of the most phantom-like description; but it is an image of silver produced by reducing agents completing a decomposition which, in our view, light began.

The next experiment is, as Mr. Lea says, still more striking, but still we think it leaves open a possible conclusion on the chemical hypothesis. A developed image is treated with the solution of pernitrate of mercury in the dark room, and, after the image is removed by this means and washed, an iron developer containing free nitrate is applied, and the image originally impressed by light is again developed. This is a most interesting and remarkable circumstance. But is it incompatible with the incipient decomposition of a portion of the sensitive film? In either case the circumstance is a remarkable one, and not very easily explained. If the whole of the image were composed of silver reduced from the film, as in the case of Major Russell's bromide plates, and had then been removed, no new image could of course have been developed. But if a decomposition in a portion of the iodide into a sub-iodide took place, which, on the application of a reducing agent containing free nitrate, at once determined the formation of a visible image, chiefly consisting of reduced free nitrate, we can conceive the removal of that image in the way mentioned, without any apparent change in the appearance, and without loss of the capacity for further development, just as readily as we could understand the phenomenon on the physical theory. It is probable that in the formation of the latent image in the wet collodion process a very infinitesimal portion of the film of iodide of silver is acted upon by light, whether physically or chemically.

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[*] *Journal of the Society of Arts*, May 13, 1853.

[†] Draper placed paper, prepared with starch, in contact with an iodized plate during exposure, which, however, showed no trace of iodine.—*Philosophical Magazine*, Sept., 1841.

[‡] "Hunt's Researches on Light," p. 115, Edition, 185

[*] PHOTOGRAPHIC NEWS, Vol. V., p. 518.

The further experiments of Mr. Lea, with a developer composed of pyrogallic acid and certain salts of mercury, are exceedingly interesting; but as an image can be developed by pyrogallic acid alone, without these salts, the experiments do not afford additional evidence in favour of the physical theory, although they prove that these salts can be thrown on the image by a developing process, so as to give it vigour, in the same manner as the nitrate of silver.

Without, however, going further into other branches of this question, we may repeat that the facts we have named furnish strong evidence that the action of light on the sensitive film is of a chemical nature; that in the formation of the latent image there is at least incipient decomposition; and that the continued action of light is capable of completing this decomposition. We believe that sufficient exposure will complete decompositions, and give, under suitable conditions, a visible image in every process with the salts of silver, but the wet collodion process. For this exception various reasons might be given; but one is obvious. If the action of light on a film of iodide of silver, plus free nitrate of silver, be to decompose the iodide, liberating iodine and producing metallic silver, the iodine will combine with the silver in the free nitrate (probably as Mr. Sutton suggests, forming iodate of silver) and liberate nitric acid. This acid, it may be easily conceived, will at once attack the image of metallic silver as rapidly as it is formed, and dissolve it. Thus, under ordinary circumstances, we can have no visible image formed in the wet process, however long the exposure.[*] If all free nitrate be removed from a wet plate, and tannin, or some other substance capable of readily uniting with free iodine, be substituted in its place, in accordance with the theory of Dr. Vogel and M. Poitevin, there is little doubt, we think, that a complete reduction and a visible image might be produced on a wet plate, as well as on dry collodion and Daguerreotype plates. If the continued action of light can complete reduction, the conclusion is inevitable that its less continued action commences reduction, and, this fact admitted, establishes, we think, the chemical theory.

THE ORIGIN OF THE DAGUERREOTYPE AND TALBOTYPE.

DISCOVERY BY ACCIDENT AND INDUCTION.

THERE are few photographers who have not wondered how the first idea of the existence of a latent image, and of the mode of developing it, first occurred to the mind of Daguerre, and many who, like ourselves, have regretted that such a meagre record was left of the many early and futile experiments and the mental processes of an investigator in an unknown field of exploration, without even analogy to guide his efforts. The sensitiveness of certain haloid salts of silver to the action of light was known, but the existence of a latent image was a thing undreamed of, and had not even a place amid the fancies of the poet, or in the speculations of the philosopher amongst "things unseen." That the discovery was the result of accident there could be little doubt; but the nature and history of that accident is a subject of legitimate interest and curiosity.

The Rev. J. B. Reade, who claims to divide the honour with Mr. Talbot in the discovery of the calotype, has related some of the details of his early labours in this direction, and has indicated the combined process of induction and accident by which his discovery was made. Whilst endeavouring to fix the images of the solar microscope by means of salts of silver, amongst other substances he employed, white leather, as a basis, was found to give increased sensitiveness. The palms of various white kid gloves were cut out, as furnishing a convenient supply of the white leather which was found most suitable for the purpose. This mode of supply was more convenient to the experimentalist than to his wife, to whom the mutilated gloves belonged, and a taboo was laid upon the gloves. Anxious to continue the experiments, Mr. Reade then reasoned that the increased sensitiveness was probably due to something in the dressing of the leather which might possibly be applied to paper with equal success, and an infusion of nut galls was tried prior to treating the paper with the salt of silver employed. This was found to accelerate the production of a vigorous image, and occasionally, when an exposure was protracted, the application of a fresh wash of the infusion of galls facilitated the operation, which was solely, it must be remembered, to produce a visible image. On one occasion, after exposure sufficiently long to produce a picture, and no trace of an image being present, Mr. Reade gave the paper a fresh application of the infusion of galls; but being shortly after called away, he threw the paper aside as spoiled, no action upon it being apparent. This piece of paper was found next morning with a well-marked image, having been developed during the night by the infusion of galls with which it was saturated, thus indicating that a latent image capable of development had been impressed upon it before removal from the solar microscope.

Of the operations of Daguerre, in arriving at his goal, through many years of patient but apparently unproductive effort, until he arrived at the wondrous result which bears his name, we have, as we have remarked, but meagre record, and we have been left to speculate in darkness as to the nature of the experiments which issued in success. That Daguerre should experiment with haloid combinations of silver we can readily conceive as most natural. Wedgwood and Davy had made some progress with chloride of silver, and the steps from chloride of silver to iodized silver plates we can understand. But how came he to believe in the existence of an invisible image, and by what steps did he arrive at the idea of developing that image? So far as we remember, there was not a single analogous fact in the whole range of science to guide him to such a conviction on the subject, and the nature of the results of Niepce were entirely different in character. A history of the processes of thought and the experimental efforts of a comparatively unscientific man in conducting such an investigation, and the grounds of that high faith which sustained him through years of fruitless search for an unknown thing in an unknown region, would have been most interesting and instructive. We have heard that an old pamphlet, published in France, gave some slight history of the discovery, but we have not been able to meet with it, and we do not know of anything satisfactory on the subject which has been published in this country. We have, however, just met with some brief details of the accident which revealed the existence of a latent image and the theory of development.

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[*] Since this article was written our attention has been called to the fact that even in the wet process a visible image may at times be formed in the camera by the action of light. Mr. Blanchard informs us that he was recently using the wet process for obtaining a negative of a dimly-lighted interior requiring a long exposure. On withdrawing the plate from the camera, a very distinctly-marked visible image was present, the forms of the windows and other lights being clearly made out. The collodion was bromo-iodized with a greater proportion of bromide than usual; and the exposure about three-quarters of an hour. Here, at least, was something more than physical action. We believe there have been cases also of a visible image formed in the camera with wet plates where iodide of iron was used in the collodion.

Of the historical authority for these facts we are not aware, but they come from a source which leaves no doubt of their authenticity. Baron Liebig, using the facts incidentally, as illustrating an argument he is stating, tells us how certain iodized silver plates, which had been exposed without apparent result, and put away by M. Daguerre as spoiled into a cupboard which contained an heterogeneous assemblage of the materials he had employed in the course of his experiments, led to the strange discovery. These spoiled plates were found on a subsequent occasion, with a fully developed image. The circumstance happened again and again in this enchanted closet, when it was at length discovered that a basin of mercury standing in this cupboard, being vapourized at the ordinary temperature of the atmosphere, had, by means of this vapour, developed a visible picture, and thus revealed the existence of a latent image.

The article by Baron Liebig is one distinguishing between two logical processes, "Induction and Deduction,"* and as the mode in which the discovery of photography as illustrating the argument is interesting, and carries with it other consequences besides narrating the interesting circumstances to which we have referred, we will quote the whole, and add one or two comments as we proceed.

"As a last example to illustrate the inductive method, as applied to technical processes, I may choose the comparatively new art of photography, as some of the processes connected with it have not yet found their explanation.

"Photography is chiefly based on two observations, first, that the salts of silver (chloride, bromide, iodide of silver) are blackened by exposure to light; and, secondly, that these silver salts, when unaltered by light, are soluble in hyposulphite of soda, so that by means of this substance it becomes possible to separate the blackened from the unblackened silver.

"These two facts constituted the starting point for the experiments of Daguerre in Paris, and those of Talbot in London, the latter endeavouring to obtain pictures on paper, the former on copper plates coated with silver. In Talbot's experiments a picture was obtained by images of the camera obscura, such as of a tower or a house, acting for some time upon paper impregnated or coated with chloride or iodide of silver. Corresponding with the varying intensity of the light, those parts of the paper which were most exposed to it became darkened in various shades, the shadowed parts remaining comparatively unaltered. The frame of a window, for instance, throws less light upon the paper than its glass panes, and a dark-coloured stone less than a bright one; all dark parts of the objects appeared bright, all bright ones dark; in fact, a so-called negative picture was formed upon the paper. By now washing the paper with a solution of hyposulphite of soda, that part of the silver coating which had not been decomposed by the light was removed. Had it not been removed, the paper would have been uniformly blackened by the farther action of daylight, and the picture of course would have become obliterated. It was therefore by means of the hyposulphite of soda that the picture was *fixed*. The first pictures Talbot obtained were very imperfect; a long-continued action of the light being indispensable for their production, none but thoroughly immovable objects could be portrayed. An improvement in Talbot's mode of proceeding was brought about in a most strange way by experiments of Daguerre. Daguerre exposed his silver plates to the action of iodine vapours, and in this way coated them with an extremely fine film of iodide of silver; but on these plates no picture was produced in the camera obscura. His experiments, carried on for months and varied in manifold ways, gave no result. Chance, however, in its more proper sense, assisted him. A number of plates he had previously experimented upon in the camera obscura had been put aside in an old cupboard, and they had remained there for weeks without being further noticed. But one day, in removing one of the plates, Daguerre, to his great astonishment, found on it an image of the most complete distinctness, the smallest detail being depicted with perfect fidelity. He had no idea how the picture had come, but he felt sure there must be something in the cupboard which had produced it. The cupboard contained all sorts of things, tools and apparatus, chemical reagents, and, amongst others, a basin filled with metallic mercury. Daguerre removed one thing after another from the cupboard, with the exception of the mercury, and still he regularly obtained pictures, if the plates, which had been previously submitted to the action of images in the camera obscura, were allowed to remain for several hours in the cupboard. For a long time the mercury escaped his notice, and it almost appeared to him as if the old cupboard was bewitched. But at last it occurred to him that it must be the mercury to whose influence the pictures were owing. For as a drawing made with a pointed piece of wood on a clean pane of glass remains invisible even to the most acute sight, but comes to light at once when breathed upon, owing to the condensation of the watery vapour, deposited in small drops, taking place in a different manner on the parts touched with the wooden point and those left untouched, just so originated Daguerre's pictures.

"Mercury being a volatile substance, the cupboard had become filled with its vapour, and this had deposited itself on the plates in the form of most minute globules in such a way that the parts most illumined were covered most, and the shadowed parts less, the result being that the outlines and shadows of all objects became distinctly visible. I will not here enter upon the improvements made in regard to optical apparatus, nor do I wish to detail how one came to fix and make unalterable Daguerre's perishable pictures by depositing on them a thin film of gold; but, returning to the pictures on paper, I still wish to say a few words about the influence Daguerre's discoveries had in improving the mode of proceeding as adopted by Talbot."

It will be seen that the discovery of the latent image and the method of mercurial development by Daguerre were the result of accident. Not so, however, was the calotype discovery of Mr. Fox Talbot. From the existence of a latent image on the exposed iodized silver plate he argued the possibility of obtaining one on iodized paper, and he selected his reducing agent from the substances known to act on salts of silver, and thus arrived at his results by a process of reduction. Baron Liebig proceeds:—

"Daguerre had found, that if his prepared plates were exposed to the light, even only for a few seconds, a picture could be obtained by afterwards exposing them to the action of mercurial vapour. As Talbot used for the preparation of his paper the same materials Daguerre had on his plates, he concluded that the exposure of the paper for a few seconds to the action of the light in the camera obscura must have produced an impression. Talbot was *convinced* there must be a picture on the paper, although he could not see the least trace of one. This *conviction* urged him on to seek something that would make it visible, for he had no doubt such a thing was really to be found.

"How, now, came Talbot to use for this purpose a solution of gallic acid?

"The solution of this problem most people might be inclined to attribute to chance, as was the case with Daguerre's pictures; but the selection of gallic acid was no chance. Daguerre had not put the basin with mercury into the cupboard for the sake of his experiments; his pictures were obtained without his doing anything for the purpose. Talbot, on the contrary, searched after the means suited to his especial purpose, and, among many thousands of substances, his imagination instinctively excluded all those that stood in no relation to it, and directed him to those which acted in a similar way to light.

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* *Cornhill Magazine*, vol. xii., p. 303.

"The salts of silver blackened by warm gallic acid as well as by light; the action of both is identical in kind, but gallic acid is by far the most powerful. The solar rays had, as he thought, produced an action on the prepared paper in the camera, but so slight that it was not visible; perhaps—so he concluded—this action might be continued and *increased* by means of gallic acid. The experiment succeeded, and the justness of the induction was thereby proved."

In the last paragraph we have a strong argument for the chemical action of light in producing the latent image, as opposed to the physical theory; and for the recognition of this chemical action we have the testimony of two such authorities as Mr. Fox Talbot and Baron Liebig.

PHOTOGRAPHY AT THE DUBLIN INTERNATIONAL EXHIBITION.

[FINAL NOTICE.]

A few words will serve to notice the remaining pictures at the Dublin Exhibition, which consist chiefly of illustrations of special processes. Mr. Swan has some very excellent illustrations of his carbon-printing process, which are well worthy of attention. The same gentleman exhibits also some examples of printing on glass by means of collodio-chloride of silver, which, whilst possessing good qualities, are not so good as some he has produced, these being either a little under-printed, or produced from very hard negatives. Millard and Robinson, of Dublin, have some exceedingly fine examples of collodio-chloride printing on opal glass, which, with outer glasses sealed in contact with the print, and mounted in lockets, &c., are very beautiful. Of our own uncatalogued examples of collodio-chloride printing it is unnecessary here to make any remark. Major Russell's illustrations of instantaneous dry-plate photography are either better prints or show to better advantage here than they did in Conduit Street. These are very bright, and exceedingly perfect and interesting as indicating the capabilities of the tannin process, with its most interesting improvements. The exhibition is not strong in examples of photolithography, but there are two very fine specimens by Mr. J. W. Osborne, catalogued, unfortunately, without his name, but with that of the lithographic printers, Korn and Co. There are several microscopic enlargements, of which the monster flea of M. Duvette is largest, and the specimens of Dr. Maddox the finest. There are some very fine examples of the same kind of work exhibited by Count Roncali, of Bergamo.

Reproduction, as we have before had occasion to remark, receives much more attention on the Continent than in this country. With the exception of the specimens of Mr. Thurston Thompson, and one or two of M. Joubert, there are no important reproductions exhibited by Englishmen, whilst some of the finest photographs in the exhibition consist of reproductions by continental photographers. From Munich three photographers, Albert, Bottger, and Adams, each exhibit a large number of very fine examples of this class of work. The Marquis de Berenger, of Paris; M. Fierlauts, of Brussels; Herr Brockmann and Herr Hanfstaengl, of Dresden; and SS. Barbi and Cinotti, of Italy, all send fine examples of photographic reproduction.

Apparatus, exhibited in Section X., amongst "Philosophical and Photographic Instruments," do not demand extended notice, the contributions being limited in number, and consisting chiefly of things which are well known. Mr. Dallmeyer has a noble display in the body of the building, consisting of photographic lenses and other optical instruments. The chief mode in which photographers can derive any notion of the qualities of the lenses, from looking at the cases, consists in an examination of the charming photographs exhibited to illustrate the capacities of the different lenses, amongst which are to be seen some of the most pleasing pictures in the exhibition. Mr. Grisdale exhibits a washing-machine, the peculiarity of which consists in an arrangement for alternately driving out the water from the prints and then re-rinsing them. Mr. Norton exhibits a machine for beating up albumen. Mr. Meagher exhibits a large case, with an excellent collection of cameras and other photographic cabinet work. Messrs. Ottewill, Collis, and Co., have a fine case with a similar collection. Mr. Solomon has a case, with a varied selection of every kind of ingenious photographic appliance. And Mr. Warner exhibits his improved camera-stand.

NORTH LONDON EXHIBITION OF PHOTOGRAPHS.

An unaccountable delay—charged, we understand, on the printer—in the issue of a correct catalogue, renders difficult a consecutive or orderly notice of the photographs exhibited in the Agricultural Hall, as many of the pictures are not inscribed with either the name of the subject or of the photographer. We select the class of pictures in regard to which this delay causes least difficulty in giving a brief notice; we refer to the enlargements, of which there is a greater variety than we have seen at any former exhibition.

The more we see of enlargements, the more convinced we become that life-sized photographs by any process are, if untouched by the pencil of the artist, in all cases undesirable, in many cases hideous. An elaborate life-size painting in black and white, however skilfully done, would in few instances be a pleasing object. The nearest approach to such a thing which can be at all tolerated is the life-size chalk sketch, vignetted and touched altogether with a light hand. If done in red and black chalk, in the favourite style of Sir Thomas Lawrence, it will be more pleasing still. But the uncompromizing black and white of an untouched photograph, even if it be a very good one, and still more if it be rugose, wiry, and harsh, is in life-size too often painfully repulsive. Wrinkles, lines, pimples, freckles, even the texture of flesh, all seem magnified in a degree which at times look like the portrayal of a monstrosity.

Are we, then, opposed to photographic enlargements? Certainly not; we simply desire them to be put to their proper use, the basis of the work of a skilled artist. Or at least, and sometimes with equal propriety, let them always pass through the hands of some one skilled in applying those touches which soften the asperities and increase the beauties, or rather the life-like effect, and remove the stony, petrified aspect so common in the untouched enlargement. In an exhibition of this kind, intended as an illustration of the technical excellence attained, we can understand that the exhibition of untouched pictures is a necessity; but the cultivation of untouched life-size portraiture as a branch of the art would be a step, in our estimation, of more than questionable wisdom and propriety.

If this view of the case be a correct one, there will be little advantage gained in the method of printing out direct on albumenized paper, as the character of a developed print will serve as well, and the texture of the plain paper on which it is produced will serve better, for finishing, than albumenized paper. The examples exhibited at this exhibition indicate that more brilliancy and finish are obtained by the printing out than by development; but since the latter is best suited for this land of uncertain sunlight, and, for finishing with chalk or paint, suits as well or better, there is less to be regretted on the score of difficulties in producing direct sun prints.

Amongst the best of those printed out on albumenized paper are a couple of specimens, by M. Palmer Descamps, of Courtrai, described as printed by Monckhoven's apparatus, from negatives by Ross's No. 2 card lens. These are not life-size, but consist of groups in which the heads do not exceed about three inches. They are bold, round, and well-defined, and not offensively coarse, but they are too black and heavy in effect to please our taste. M. Rolloy, fils, has some excellent examples of the same mode of enlargement, contributed by Mr. Solomon. Mr. Smith exhibits several enlargements taken in the same way; one of these is exceedingly vigorous, brilliant, and well defined. The same gentleman unfortunately exhibits others which are hard, flat, and inartistic, tending much to destroy such reputation as that we have just mentioned would have secured to him. Mr. Hooper exhibits some scrupulously untouched enlargements, which are printed out, we believe, and are more free from the offensive coarseness to which we have referred than most such pictures as we have seen. These are round and well defined, and, of the class, all very excellent.

The process of enlargement by development is well represented by Mr. Aldis, who contributes a great variety of illustrations, from about twelve by ten inches in size to eight by five feet. Some of the smaller pictures exhibited by Mr. Aldis, in which the enlargement is not more than three or four diameters, are excellent in themselves, without retouching; we may mention 266 and 341 as examples. The life-size pictures, produced by development, must all, confessedly, be regarded as materials for the painter to work upon, and for that purpose they are admiraby adapted. Some of the Swiss views exhibited by Mr. Aldis, enlarged from small negatives by Mr. Stephen Thompson, are well worthy of examination, and suggest that within moderate limits landscape enlargements may be very successful, and may furnish a field for enlargement possibly more suitable and satisfactory than portraiture. Mr. W. Woodbury exhibits a few examples of enlargement by development, which are very successful; a group and a Malay head are exceedingly good. Both Mr. Woodbury and Mr. Aldis employ artificial light for enlarging. Mr. Palmer, of Stonehouse, exhibits some capital enlargements; one, of a singular pinkish tone in the lights, possesses many points of beauty; the drawing of the lady's eye is a fine study for a painter. The enlargement on opal glass is too cold in tone. The enlargement on canvas is an application to the right purpose. We have seen examples by the same gentleman in which a greater uniformity or evenness of tone was secured; but this is a point quite unimportant, since the whole will be covered by the pigments of the painter.

For large untouched portraiture, however, we repeat that the portrait of a lady, exhibited by Maull and Co., and the portraits of Fechter and that of Miss Kate Terry, by Southwell Brothers, far surpass, in our estimation, the best enlargements exhibited.

PHOTOGRAPHY AND ARCHÆOLOGY.

BY W. WARWICK KING

Your facetious correspondent who accused me of "airing" my "hobby" will doubtless, when he sees the present number of the News, say "he is at it again;" but though I am partial to the study of archæology and photography in connexion therewith, having experienced great pleasure therefrom, and desiring that others should do the same, yet I do not wish to take the same line as the irate gentleman did with regard to the stranger at table who did not take mustard with his beef; and knowing that Englishmen are, above all other nations, more easily led than driven, with that object in view I put on record a few notes of the late meeting of the Archæological Institute at Dorchester. Archæologists as a body have always felt an interest in photography, knowing its importance in aiding their study. The draughtsman they were quite aware might represent a thing to be much more perfect than it really was, a state of things hardly favourable to a science which in these modern times requires care and exactitude. The early notices of photography in "Notes and Queries" will fully bear out this remark, and if that should be deemed insufficient, we have only to compare the engravings in some well-known archæological works with photographs of the subjects there represented to know how much more useful the latter are.

During the meeting I frequently heard members of the Institute express a wish for photographs of particular objects or portions of architecture, and the *Building News* lately printed some observations to the same effect. In a recent number of that paper Mr. W. Burges, the eminent architect, rendered full justice to photographs of ancient work, though for study for the young architect he preferred the sketch, as his thoughts would be more concentrated on the work itself than on the representation thereof which he was producing.

First, then, with regard to the temporary museum. Mr. Pouncy exhibited some beautiful reproductions of the Roman Pavements in Dorchester, for which his process seemed admirably adapted. Mr. Shout, an architect, sent some photographs of details in Wells Cathedral, and a very successful interior of Yeovil church,—a difficult subject, for the nave was not lighted by a clerestory. He had vignetted this print, which I am inclined to think was a mistake, for however well that process may suit a landscape, it does not agree with the straight lines of a building. Mr. J. H. Parker, F.S.A., exhibited some photographs of the house of Pudens at Rome, and of the exquisite mediæval houses in the close of Wells, rescued by him from their impending destruction at the hands of those who ought to have appreciated them as they deserved. I may mention as one generally finds that the photographs of places of interest in the town, by some of the local photographers, were not to be commended, but some of Mr. Frank M. Good's exquisite photographs of Corfe Castle and Wimborne Minster were in the shop windows, and put all the others into the shade by the neat manipulation and careful selection of point of view which they evinced. Dorchester itself presents some effective points. The Town Hall and the church close by give the place almost a continental look, while the avenues of trees leading to and surrounding the town itself seem, from their similarity to boulevards, to confirm the delusion. I shall not name all the places which would repay the photographer for a visit, but simply those which I visited myself, not merely those I saw in passing. Having taken up my quarters at Weymouth, I went over to Dorchester almost daily, and had the additional pleasure of a sea bath before going to work, or rather to pleasure. Our first visit was to Sherborne, whose noble church has recently been restored in a gorgeous manner, but perhaps too much to command the archæologist's entire approval; some good negatives might be got of the interior; and one of the town from the neighbourhood of the railway-station would be effective. Mr. Treble, of Salisbury, has produced a very fine photograph of the modern sculpture of the reredos, but I do not know of much else being done. In the grounds of the Castle are some beautiful views, and one which I saw of the lake on entering the grounds made me wish for a good wet collodion plate. There were in a beautiful bay a large number of swans, who seemed motionless, and fully justified Mr. Glaisher's remark of Mr. Frank Haes' stereos taken in the Zoological Gardens, viz., that animals generally put themselves in graceful positions. Portions of the old castle demolished by the so-called Commonwealth would make good pictures, especially that of an entrance to the great hall; some Norman arches remain, but a great spray of ivy, hanging down from the outer surface of the vaulting, rather injures the effect.

The next excursion was to Wareham, Corfe Castle, and Wimborne Minster. An amusing incident occurred here. I noticed among the vehicles which were to convey the party to Corfe one of a black colour; but its nature was to a certain extent hidden by some bright-coloured cushions on the knife board. The driver of the one on which I was seated informed me that the suspicious-looking vehicle was one of Shillibeer's funeral carriages, which had been brought into requisition by the large number of visitors to Corfe. Corfe and its castle (which, in its ruined state, is very noble) have been photographed from nearly every point by Mr. Good, who seems, like Mr. F. Bedford, to be what every landscape photographer should be, an archæologist as well as a photographer. Returning to Wareham, I saw little work for the camera, but plenty for the sketcher in the curious leaden font in the church, with its figures of the twelve apostles, and a chapel on the south side of the chancel containing a cross-legged effigy in mail armour, and some curious stone coffins, in shape somewhat like a boat, as if the Norman wished to retain something of the Northmen in their love for the sea.

From Wareham we went to Canford, the seat of Sir Ivor Guest. On our way I saw a most lovely "bit" near the entrance to his park. It consisted of a thatched cottage on the side of a hill, up which a road ran, bounded by trees on either side. It was one which would attract every landscape photographer. Canford Church has some curious points, especially a Norman doorway and window. The park itself is not of much interest, but Wimborne would repay a visit, especially if one could get such a view as that given in an etching by the Rev. J. L. Petit, printed in the Salisbury Vol. of the Institute's Proceedings.

I took a few plates with me from town, and one day left the Institute for an archæological and photographic trip on my own account. Leaving Weymouth I went to Preston, a pretty village, which I intended to photograph, but luckily, before putting the plate in the camera, I discovered a hedgerow of willows which rendered it necessary for me to abandon my attempt, as I did not desire to produce a picture which, from the motion of these trees, would decidedly prove a failure. I next came to Osmington, with its neatly-kept churchyard, looking, from the comparative absence of pagan tombstones, a veritable God's acre. From thence I went to Poxwell, a place with an uninviting name, which it certainly did not deserve. Murray's guide to Wilts, Dorset, and Somerset, simply says that there is a curious church and old manor house near thereto, not a very definite description. I secured some photographs of both. The church possesses many features of interest, and, to my regret, I heard that it was to be destroyed, and a new one built—a proceeding which a friend (a civil engineer), who accompanied me, characterized as quite unnecessary. The house itself has never been finished, but there is a curious gateway, with a chamber above and a pyramidical roof. Over the entrance is the date 1634. This erection is covered with ivy, and makes a very effective picture. On returning, at intervals we saw the Isle of Portland, but the view was too distant for the photographer, otherwise it would have been very effective.

The last excursion was to Athelhampton, Melton Abbey, Binghams Melcombe, and Walterton. On our way we passed through Yellowham Woods, the road through which was most beautiful; it was fringed on both sides with the common brake fern, which grew most luxuriantly; and looking through breaks, you saw the same fern covering the slopes of the valley, forming, with the trees, lovely bits of landscape. Athelhampton would form a good subject, although, *mirabile dictu*, the most interesting part, the gatehouse, fortunately engraved in "Parker's Domestic Architecture," has been recently demolished. From thence we reached Melton Abbey. The park affords some magnificent views, and the abbey itself is very effective considering that the choir and transepts only were built but a short time before the Reformation. Binghams Melcombe, with its church close to the old manor house, would form a good subject. The old bowling-green remains, and a fine yew hedge. Walterston is Jacobean, but curious and valuable as an illustration of a debased style.

I must now conclude a paper which I fear is already too long, though it will be seen that I have named but few places; yet the photographer, I think, will thank me for directing him to what is in some respects a new ground; and let him bear in mind the saying of one who is well worthy of every photographer's respect, Mr. H. P. Robinson, that photographers ought to find artistic effects everywhere.

If this paper is of too archæological a character, I must plead in justification the following quotation by and words of the present Professor of Archæology at Cambridge:—"Hæc studia adolescentiam alunt, senectutem oblectant, secundas res ornant, adversis perfugium ac solatium præbent; delectant domi, non impediant foris, pernoctant nobiscum, peregrinantur, rusticantur." "Every one who follows a pursuit in addition to the routine duties of life has, by so doing, a happiness and an advantage of which others know little. The more elevated the pursuit, the more exquisite the happiness, and the more solid the advantage. Now if

"'The proper study of mankind is man,'

then archæology is one of the most proper pursuits that man can follow; for she is the interpreter of the remains which man in former ages has left behind him. By her we read his history, his arts, his civilization; by her magical charms the past rises up again and becomes a present; the tide of time flows back with us in imagination; the power of association transports us from place to place, from age to age, suddenly and in a moment; again the glories of the nations of the old world shine forth;"

"'Again their Godlike heroes rise to view,
And all their faded garlands bloom anew.'"

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ON THE IMPROVEMENTS TO BE EFFECTED IN DEVELOPING WITH THE SALTS OF IRON.

BY M. MC A. GAUDIN.

For several years past a solution of protosulphate of iron has been very generally substituted for pyrogallic acid as a developer. The salt of iron presents the advantage of rendering the half-tones with great fidelity, but it is difficult to obtain great intensity with it, and it almost always requires a subsequent intensifying with pyrogallic acid. The employment of ammoniacal sulphate of iron has led to further progress; still, with the salts of iron at present employed, we never obtain an intensity proportionate to the duration of exposure.

It must be remarked of sulphate of iron developers, that their acidification by acetic acid occupies the first rank, and for a good reason, namely, the efficacy of acetate of iron itself, which I have many times proved without being able to explain it; but, in consequence of a series of fortuitous circumstances, I believe I have at length penetrated the mystery.

Having to reduce and copy by photography, before sending them to America, a numerous series of drawings in common ink on large cards, I placed them in the hands of a photographer of average ability, but the sight of the first negative he showed me convinced me that he would never succeed. The whole was rendered with perfect fidelity, but the white ground of the cardboard was represented by a kind of transparent grey substance, resembling a cobweb; and upon the assurance of my photographer that he could not do better, I saw very clearly that the weakness of the negative was due to several causes combined, that is, to the collodion being too-weakly iodized, to the imperfection of the objective, to the too large aperture of the diaphragm, but especially to the imperfection of the iron developer employed.

I was therefore obliged to avail myself of the consummate skill of M. Bissan, jun., who, as is well known, unites in his pictures vigour and brilliancy, with a gradation of aërial perspective so perfect, that when we look at them through the hollow of the hand they exhibit a complete stereoscopic effect.

While I assisted, from curiosity, at his first attempts, I was astonished to hear him say that the exposure had been too long, while the negative presented the meagre and ashy aspect of the productions of my first photographer; and he added, "If the exposure had been one-half less, the ground would have been represented by a much deeper shade"—which fact he at once proceeded to prove to me.

This incident was like a ray of light to the discovery of the varied effects of iron developers. I immediately recognized, without entertaining the slightest doubt, that if, in consequence of too long an exposure, the white ground was represented by a film of less intensity, that it was due only to the texture of the precipitate, which was disseminated in isolated spots, instead of being spread with perfect uniformity, so that, with an equal deposit of silver, the granulated film became inferior in opacity only because the light could pass freely between its interstices, however small they might be, and henceforth I better understood and felt the great superiority reserved for the proto-acetate of iron, for many reasons, all concurring to the same end, namely:—1. Because the picture manifesting itself more slowly, the developer has time to mix itself perfectly with the free nitrate of silver. 2. Because this slowness of action actually produces a continuous reduced film, which, by transparent light, passes from orange yellow to intense red, finishing with bistre, which is red by reflected light. 3. This slowness of action permits of the utilizing the whole of the free nitrate of silver, and of adding as much as we please, without the liquid ever becoming thick and forming a deposit. In preparing acetate of iron by double decomposition with concentrated solutions, its reducing power is much too strong; the picture does not appear, because the effect is produced instantaneously in the floating liquid, which becomes muddy. It is necessary that the salt of iron be previously brought to a higher degree of oxidation. For example, if we add to the iron solution, while still red and working well, some acetate of lead until the sulphate is almost wholly precipitated, we obtain an excellent developer, which will give *red* blacks in complete harmony with the intensity of the light.

Now that I have mastered all the conditions of the problem, I propose to devote myself to the preparation of this precious developer for the benefit of photographers, and to spare them failures exactly as is practised in the preparation of celebrated collodions, which it is quite easy to obtain ready for use; for the employment of iron as is usually practised, with the obligation of pouring it instantly over the entire surface of the plate, immediately expelling the silver intended to give full intensity to the picture, appears to me a very barbarous process, liable to many inconveniences.—*La Lumière.*

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IMPROVED WASHING APPARATUS.

Mr. Grisdale has just patented an apparatus for washing prints which involves an application, novel in this instance, of the principle of centrifugal force. The prints are attached to a surface of perforated or woven material, and arranged round a drum, which revolves in a trough containing water, only a portion of the drum being, however, submerged. On communicating a rapid motion to the drum the prints are alternately immersed in water, and then whirled round with sufficient force to drive off the moisture, thus securing a most effectual application of the alternate washing and draining principle which has been already recognized as the most desirable in getting rid of all traces of moisture. The following extracts from the specification will explain the matter in full detail:—

"My said invention relates to a peculiar construction and arrangement of centrifugal machinery or apparatus for washing photographic prints, and consists, according to one arrangement, in the employment of a peculiarly constructed revolving drum in combination with a trough, in which such drum is partially immersed. The prints to be washed are taken from the water in which they have been placed on their removal from the fixing or other bath, and are packed in one or more piles, which piles are placed round the circumference of the drum, each pile being composed of alternate prints and sheets of wire gauze, or other open or reticulated fabric, so that no two prints shall be in contact with each other. These piles are held in their places on the drum by means of open frames or gratings which bear against the opposite surfaces of each pile, and are secured to the arms of the drum by screws or otherwise, the whole or a portion of such frames or gratings forming part of the drum itself.

"Or, according to another arrangement, the piles above described may be laid flat upon a disc, which is made to revolve either vertically or horizontally in a trough or cistern, provision being made in the horizontal arrangement for allowing the piles to be brought in or out of contact with the water as required; or in lieu of the photographic prints being disposed in the form of piles or packs round a drum or revolving disc, they may be laid separately and individually round the surface of a drum, a webbing of open or reticulated fabric being wound on such drum simultaneously with the placing of the prints thereon, so as to interpose a thickness of the fabric between each succeeding layer of prints. The process of washing consists in alternately driving out the moisture from the prints by the centrifugal action of the revolving drum or disc, and saturating the prints again. During the first part of the process the prints are not immersed, but when the second part of the process (namely, the saturation) is to be effected, the trough or cistern is to be supplied with water, or the prints may be brought down into the water, and caused to revolve therein until thoroughly saturated, when the water may be run off from the trough again, or the drum or disc elevated, and the moisture expelled by centrifugal force as before."

Diagrams and further detailed explanations follow, and the specification concludes as follows:—

"Having now described and particularly ascertained the nature of my said invention, and the manner in which the same is or may be used or carried into effect, I would observe, in conclusion, that what I consider to be novel, original, and therefore claim as the invention secured to me by the hereinbefore in part recited Letters Patent, is:—

"First, the system or mode of washing photographic prints by alternately saturating them with water, and expelling such water by centrifugal machinery, substantially as hereinbefore described.

"Second, the application and use of a revolving drum of perforated metal wire gauze, or other open or reticulated material in combination with a trough for the purpose of washing photographic prints, by alternately saturating the same with water, and expelling such water therefrom by centrifugal force, as hereinbefore described.

"Third, the application and use of a revolving disc in combination with a trough or vessel, for the purpose of washing photographic prints, in the manner hereinbefore described."

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THE ROYAL CORNWALL POLYTECHNIC PRIZE MEDAL AWARDS FOR PHOTOGRAPHS.

This Society, which holds its annual meetings in the old packet town of Falmouth, has just concluded a most successful exhibition, a more than usual series of scientific and other attractions having been provided and cared for by the managers and directors, and most indefatigably backed up by the persevering secretaries, Mr. S. Hedges and Mr. Genn, and the *Art Union* manager, Mr. Stephens. The Society was commenced in 1833, principally by the exertions of some active and clear-sighted ladies, amongst the foremost of whom were the Misses Fox, who solicited and collected subscriptions. in order to appropriate the same as *awards* and *prizes*, in order, as they stated in their printed report—and which might serve as a text for any similar institutions in the kingdom—"to stimulate the ingenuity of the young, to promote industrious habits, and to elicit the inventive powers of the community at large." In 1835, his late Majesty King William IV., the "sailor King," who had in his youth enjoyed many roysting bouts in the old packet town, became the Patron of the Society, when it assumed the name and title of the "Royal;" but the crowning feather in the Society's cap, and the "Good Deed," that will ensure it the respect and admiration of humanity at large, and of the whole British nation, was the premium of 500*l*., offered in 1843, though collected some few years previous, for the "best means of facilitating the ascent and descent of deep mines." This originated and brought into use the celebrated Tresavean Man Engine, which has saved life and limb to a very great extent, and shielded hundreds of miners and their families from the tenderness of the Poor Law and its unions. In 1852 the Society established the attraction of the *Art Union*, which, under the management of Mr. Stephens, proves a great and well-merited success; but the point that more immediately concerns this publication, and which calls for the approval and appreciation of all connected with the pencil of light, or, as our American cousins would say, "devotees to the rays of Sol's sparkling beams," is the fostering care and open-handed welcome awarded to photography, which is this year more than usually rich in choice and magnificent specimens.

The following awards have been made:—The first silver medal to Mr. James Mudd, of Manchester, for his collection of English, Scotch, and Welsh views, the prize being specially given for No. 572, a specimen which, for general excellence and artistic effect, has never been surpassed. Mr. H. P. Robinson received the second silver medal for some beautifully-executed portraits, possessing all those qualities for which he is so famous. The centre group of the "May Gatherers," though exhibited here before in the complete composition picture of "Bringing Home the May," loses nothing by the repetition. Mr. W. H. Warner, of Ross, receives a second silver medal for some landscapes, printed with most telling and brilliant cloud effects. The United Association of Photography, which is mainly indebted for its success and prosperity to the great exertions and skill of Col. Stuart Wortley, exhibits some carte pictures by their Wothlytype process. An extra silver medal was awarded on account of the great excellence and high artistic treatment displayed in these specimens. A first bronze medal was awarded to Mr. S. Thompson for his "Book Illustrations," a series of photographs of remarkable places—objects of interest in Switzerland, Savoy and Piedmont, and intended to supply the place of engravings on steel, copper, or stone. A first bronze medal was awarded to Mr. Cole, of Hornsey Rise, for his excellent photographs of the rock and cliff scenery of Devon, Cornwall, and Dorset, and intended to assist the geological student. Mr. Swan, of Newcastle, receives a first bronze medal for specimens illustrating his new patent carbon process; and, as one of the pictures is printed from the same negative as one of Mr. Warner's, a good opportunity has been offered for the admirers of the arts to compare the widely different silver and carbon process.

A bronze medal was awarded to Mr. J. E. Palmer, of Union Street, Stonehouse, the inventor and patentee of the celebrated "Cinque Gems," for his enlargements on opal glass, paper, and painters' canvas.

A series of photographs by Mr. Trull, of Falmouth, received a money award of 1*l*.

Two frames of carte pictures, by Messrs. Stephens and Knecht, of Falmouth, and which possess more than ordinary merit, received a first bronze medal. By the above it will be perceived that "awards of honour and merit" have been bestowed by the Society with no niggard hand, considering the claims on their funds from other departments. Photographers may also feel proud that their beautiful art has been so well represented and so thoroughly appreciated in the West, and the readers of the News may be assured that, though the high awards of honour were carried off principally by experts and skilled manipulators from the East, the local and country operators came out in full force, and, in many instances, lost but little when compared with their more successful competitors.

Another correspondent sends us some futher details, and since this is a society which has always honoured photography, the further communication will interest many of our readers:—

Dear Mr. Editor,—Another vacation ramble to the land of fish, tin, and copper was opportune enough to enable me to visit the Annual Exhibition of the Royal Cornwall Polytechnic Society, and, considering the distance of Falmouth from the centres of manufacturing industry, and other local disadvantages, a truly marvellous collection of useful and beautiful articles was displayed; but, as you confine yourself to the Photographic Art, it will be useless for me to enter into a dissertation, either on the large display of paintings, both professional and amateur, or the attractive little models of machinery, some of which were in working order. The ladies' stall of plain and fancy work must be also passed by, together with the Natural History table, with its pans of Anemones, books of ferns and indigenous plants, and other interesting articles.

The Photographic department seemed to have been especially cared for in catering, looking to the number of pictures displayed, the walls on both sides of the hall being covered for a space of between 50 and 60 feet, and from 4 to 6 feet high on each side; but as they are in the lower part of the room under the gallery, I should like to have seen many in a better and stronger light, as my eyes, from long use of the *focus* glass, are not so strong as they were thirty years ago.

The first specimens after entering the door are by Mr. W. Brooks, Penzance, consisting of some most excellent stereoscopic views of coast scenery in the neighbourhood of the Land's End, and carefully-executed whole-plate landscapes of St. Michael's Mount and other western localities. The next exhibitor is Mr. J. E. Palmer, Plymouth, occupying a large space with opal pictures, carte vignettes, quinque gems, and enlargements, both plain and coloured; of these latter, two were likenesses of Mr. Stephens, who is connected with the Society as manager of the Art Union, and well merit the award the judges made to the exhibitor, of a first bronze medal. W. H. Warner, of Ross, also has a large collection, number from twenty to twenty-four, most of which are of a high character, being printed from negatives by H. Grant, Esq., many of them having some excellent clouds printed in from a second negative by the exhibitor; the Society's special prize of a silver medal for the best landscape was awarded. The next we come to are some lovely specimens of carbon printing by J. W. Swan, and seemed to be looked at with great interest as showing what can be done with this comparatively new process, which is likely to be of great value; the ticketed award was a first bronze medal. The Limited Liability Co., the London Association of Photography, appear to think this Western Institution to be of sufficient importance to exhibit their productions, of which there were four large frames which, while containing some very excellent specimens of photography in carefully lighted heads, held others not above mediocrity. I was very glad to see them, however, in the hall, having before only seen them by hurried glances; and if these are the best the process is capable of, I shall not care to give up the brilliancy obtained by silver and albumen. The green ticket of second silver medal was attached.

On the other side of the room is a large frame, containing pictures on opal, coloured, and plain carte vignettes, and a very pretty landscape and case portraits, by Mr. J. F. Trull, a local artist whom the judges have rewarded with a sovereign. Some of the prettiest collections are those by Stephen Thompson, who has sent a number of his beautiful small vignetted landscapes, which are intended to illustrate a Book of Scenes of Travel in Italy; and, in looking at them, one is struck with the idea, how much more valuable would become the better editions of Scott's Poems, Rogers's Italy, and other works of a similar class, if containing such illustrations as are here shown, more especially if printed by the carbon process, that the picture might be as imperishable as the letterpress portion of the work: for these a first bronze medal is given. Mudd, of Manchester, occupies a large space with some splendid landscapes, the negatives by the collodio albumen master—a pretty specimen of art. The Ulswater Lake has been adjudged the first silver medal, as the premier prize in the department, for the best picture; although pretty and good, I much preferred some grander specimens. H. P. Robinson is represented by five pictures (the centre group, vignetted) of his celebrated "Bringing Home the May" "Sunshine," "Evening," "Portrait of a Gentleman," and "Portrait of a Lady." Of the latter I do not know how to speak in terms commensurate with its merit as a specimen of photographic portraiture, as it is the finest specimen of this branch of the art that I have beheld. The figure stands out as round and as fine as sculpture, while the lace veil over the dress, with the white petticoat underneath, is presented in a manner truly wonderful: the silver medal for the best portraits is the award. To two frames of cartes de visite exhibited by Messrs. Stephens and Knecht, of Falmouth, are awarded a first bronze medal, being considered the finest of the kind in the exhibition. Some beautiful specimens of coast scenery and rocks, as studies, are sent by an amateur, Mr. J. J. Cole, of Hornsey Rise, London; and to the geologist and lovers of nature in her hardest form these pictures must be as valuable as interesting. The judges appear to have entertained this idea, by awarding them a second bronze medal. Another amateur, Mr. Coffin, Devonport, sends stereograms of English scenery, and some very interesting slides of Chinese views and the customs of the people; and, as somebody always will be late, a little frame of cartes de visite, by Mr. Hosman, of Cheltenham, of cats and dogs, so perfectly sharp, leads one to believe that the originals must have been procured from the taxidermist; this frame is without a number, and not in the catalogue.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, August 30th, 1865.

On the 15th of August the name of Mr. Claudet figured in the list of newly-created Knights of the Legion of Honour, published by the *Moniteur Universel*. This recompense, so well bestowed, was greeted with loud expressions of satisfaction by the principal French photographers. Several of them, amongst whom I will mention the name of M. Niepce de St. Victor, came to request me to transmit their congratulations to their able *confrère*. Not for you, nor for the readers of the Photographic News, need I recall to mind the labours of our friend. It is in England that those labours have been accomplished, and if he does honour to the French name at London, it is the English who have gathered the first-fruits of his happy researches, of his improvements, and his inventions. You will certainly applaud, as we do, the reward — the tardy reward — of his persevering labour; for you know as well as we the ceaseless, the indefatigable ardour with which he has pursued his work, the disinterestedness which he has shown in causing the public to participate in the results of his experiments, and in sacrificing everything for the progress of an art which he loves so passionately.

Since 1855 not a year has elapsed without the decoration of the Legion of Honour being bestowed upon some photographer, which proves the importance which in France is attached to photography. The following are—barring error or omission—the names of those experimenters and artists who have been, down to the present time, deemed worthy of the distinction. They are—Messrs. Niepce de St. Victor, Blanquart Evrard, Maxime du Camp, Salzmann, Braun, Baldus, Martens, Bertsch, Poitevin, Bayard, Duboscq.

Bisson, junior, arrived a few days ago from Italy, where he has spent—and most profitably spent—six weeks, for he brings back with him 70 clichés, representing the principal edifices, and most beautiful sites, of Rome, Venice, Turin, Milan, Pisa, Florence, &c. As the size of these pictures renders them suitable for binding in albums, they will rapidly become popular. The pictures that I have already seen are admirably successful. They were obtained, as usual, with wet collodion, and with Dallmeyer's Triplet Objective. Bisson is pleased to enthusiasm with the results that he owes to this apparatus, and which no other had yet given him. I am happy to be his interpreter on this occasion, and I call attention to his judgment with the more pleasure, as it confirms that expressed by all photographers who have operated with this apparatus.

As I am speaking of apparatus, I will say a few words on the success which has been obtained in France by Dubroni's pocket photography. It is what we call a plaything, and yet we must confess that grown-up persons are as pleased with it as children are. In the past few weeks more than a thousand of these little laboratory-boxes have been sold, and the manufacturer is unable to keep up with the demand. I myself had occasion to make use of the toy during a two weeks' stay at Enghien, and I must declare that I am delighted with it. Not being at my own home, it would have been impossible to do anything serious in the way of photography; but, thanks to this pocket apparatus, I was enabled to bring back those views of which I desired to keep a memento, and groupes of the friends that surrounded me. The inventor has so well foreseen each detail, the boxes are so complete, that, after a single lesson, two lads who were with me operated with such success that their pictures are certainly the best that I have brought back with me. Their success encouraged elegant ladies who were looking on, and who wished to try their hand too. You may imagine what was their satisfaction when they had gratified their desire without incurring a single stain to tarnish the whiteness of their fingers or the freshness of their toilette. In truth, the idea is a charming one, and has been wonderfully well realized. This invention, which makes of photography an amusement for all, will certainly act more widely and more rapidly for the popularization of the art than would the most learned discoveries, and all that we can publish in our journals. I am convinced that the future will confirm the opinion I have advanced.

Carbon photography and the processes derived therefrom have latterly taken a remarkable development in France. M. Poitevin's two methods, the first with bichromate of potash, and the second with perchloride of iron and tartaric acid, which are still patented, are at present employed by a large number of photographers in Paris and the provinces, who get supplied with the needful license either by M. Despaquis, the acquirer of the first patent, or by M. Poitevin, who has kept the property of the second. There was for a long time hesitation on the subject, because it was thought that the method was incomplete and the results insufficient; but the fine pictures recently exhibited by M. Blaise, of Tours, and M. Soulier, of Paris, have decided the question in the most favourable sense. Now, it is with processes as with fashions; as soon as the vogue has set in, everyone is eager to follow it. Very soon the public, having in their hands such beautiful and evidently indestructible pictures, will refuse to hear of any others, and laggard photographers will be compelled to step out.

Photo-lithography, too, is upon the road to progress. By happy modifications, M. Marie has been able to complete the original processes, and to render them more perfect and practical. Several works, too, illustrated in this manner, are now in course of publication.

The conclusion to be drawn from all that precedes is, that photography is going through a transition which will result in its being placed upon a field at once new and more abundantly fruitful. Ernest Lacan.

Talk in the Studio.

Photo-Relievo Printing.—Mr. R. H. Courtenay, of Brighto referring to Mr. Woodbury's recent description of the photo-relievo process of printing, wishes us to put upon record his statement that he has in progress a method of printing similar in principle, but differing in mechanical and chemical appliances. This process is stated to be a modification of one by Herr Kobell, of Munich, made known to the French Academy by M. Brouquiart, twenty-five years ago. Mr. Courtenay has promised to show us some of his productions shortly, when he visits London. At present we know nothing more than we have stated, and put it on record, as he remarks he would not like to be liable to the charge of appropriating Mr. Woodbury's ideas. Mr. Woodbury's process is the subject of a patent.

Archbishop Manning.—Messrs. Moira and Haigh have just issued a series of portraits, cards, and larger sizes, of the recently-created Catholic Archbishop Manning, in the full costume of his office, which are exceedingly fine examples of photography—round, delicate, brilliant, and well arranged.

The Archbishop has a fine intellectual head, and severely cut and somewhat worn face, the type of an ascetic churchman.

A Town without a Photographer.--A correspondent who has been sojourning for some weeks in the ancient borough of Harwich informs us that, as yet, there is no photographic establishment within its precincts or the neighbourhood. Considering the population, the crowds of holiday folk and visitors that resort to it, and its fashionable suburban watering-place, Dovercourt, and the many towns and large villages of considerable local importance thickly nestled about the borough, this is somewhat remarkable; the more so as all these places are rapidly improving. Our correspondent thinks there would be a good opening here for a clever young photographer, especially if allied to some other congenial occupation. Perhaps some one or other of our young and energetic subscribers may feel disposed to act upon the hint.

Amateur Photographic Association. — We understand that the prizes, amounting in value to about £70, were awarded last week. The report will be published very shortly.

Microscopic Photography.—The *Athenæum* says:—"Critics have long been at war as to the power of the hand to baffle the power of sight, by work almost infinitely minute. Optical work is exceedingly delicate, a thousandth part of an inch being quite a considerable space. Mr. Ruskin asserted, and Mr. Kingsley proved, that Turner's dots and lines were finer than the finest work done upon such lenses as those of Lord Rosse's telescope. By-and-by, the sun may be able to distance even the artist's pencil in producing small and yet perfect work. A friend has sent to us, from Melbourne, a copy of the Colonial Land Act for 1865, done in the Photographic Department of the Land Office in that city, so minute as to be scarcely visible to the eye, the whole fifty-two pages, folio, being printed on a bit of paper about the size of a bank-note. This dainty production is the work of Mr. Moone.

The "Wavish" Lamp--At the Falmouth Polytechnic Exhibition, a lamp invented and patented by Mr. Wavish, of Torpoint was shown; and, from its great and peculiar features of intensity, of illumination, simplicity, and cheapness, may be found worth the attention of photographers, as the dull and dark weather is about setting in. The lamps are fed with paraffine oil, giving a more brilliant and intense light than the ordinary oil. They also require less trimming and less attention; and as concerns cheapness, a lamp was sent by train from Plymouth to Exeter and back seven or eight times—extending over a space of forty hours—and the cost was found to be 3½d. It may be also found of great service to photographers, and is well adapted for burning in a "Lamp Stove," which said stove, being completely innocent of giving out either dust or dirt, will be found a most invaluable adjunct for the studio. We shall possibly have something further to say in reference to the above.

The Sun the Great Source of Power.—Professor Wheatstone has recently constructed a powerful thermo-electric battery. The *Scientific American* says:—"Not unnaturally, this thermo-electric battery is exciting the imaginations of men of science, causing them to call up wonderful visions of a future when much of the work of the world shall be done by *sunshine*. Thus a contemporary suggests that, 'like windmills, thermo-electric batteries might be erected all over the country, finally converting into mechanical force, and thus into money, gleams of sunshine, which would be to them as wind to the sails of a mill. What stores of fabulous wealth are, as far as our earth is concerned, constantly wasted by the non-retention of the solar rays poured on the Desert of Sahara! Nature here refuses to use her wonderful radiation-net, for we cannot cover the desert sands with trees, and man is left alone to try his skill in retaining solar energy. Hitherto helpless, we need not be so much longer, and the force of a Sahara sun may be carried through wires to Cairo, and thence irrigate the desert, or, possibly, if need be, it could pulsate under our streets, and be made to burn in Greenland.' A fascinating dream enough, and one which may prove to be 'not all a dream.'"

To Correspondents.

*** To CORRESPONDENTS, AGENTS, and ADVERTISERS.—REMOVAL.—On and after the 15th of September, the Photographic News will be published by Mr. Piper, at 15 and 16, Gough Square, Fleet Street. The Proprietors have found it necessary, for the satisfactory transaction of business, to remove their printing and publishing offices to larger and more convenient premises at the above address. Gough Square is entered from Fleet Street by Bolt Court and Wine Office Court. Communications for the Publisher should be addressed to Mr. T. Piper; for the Advertising Department, to Mr. Dring; and for the Editorial Department, to the Editor, 15 and 16, Gough Square, Fleet Street, E.C.

Collodio-Bromide of Silver.—In answer to several correspondents, Mr. Sayce's address is 17, South Castle Street, Liverpool.

F. M. T.—We are glad to hear of your success with collodio-chloride of silver. The tone you secure by immersing the unwashed plate in hypo without gold, is sulphur toning, and is due to the decomposition of a portion of the hypo by the citric acid in the collodion. Regarding precipitation, we have already stated that some we made twelve months ago is still free from deposit. Some we received from Mr. Swan at least four months ago, is as good as ever. We tried a print the other day with it, after it had stood without any shaking for a month. It was as good in all respects as at first. We have not tried that of the other makers you name, but the sample to which we have just referred is as perfect for opal glass as possible.

Young Amateur.—From the description of your troubles, it is very probable that your collodion is faulty. The fact that the bath commences to work well, and after immersing a plate or two fogs, suggests that it is the collodion. The blue opaque-looking film left after fixing, which you describe, suggests that the collodion is unsuitable or decomposed. Try another sample. For positives, you may with propriety work with a bath freely acid with nitric acid.

Aspirant.—"Ammonia-sulphate of iron" and "double sulphate of iron and ammonia" are two terms indicating the same thing. The term means exactly what it expresses; the salt is formed by combining in their equivalent proportions sulphate of ammonia and sulphate of iron. You may use it in the formula given for a gelatine combination with the iron developer, but it is not necessary.

James C. Leake.—We are obliged by your letter; but do not agree with your opinions, which are formed with a much less perfect knowledge of all the circumstances involved than we possess. The matter is, however, one of too little importance for discussion. On the subject of honorary awards to excellence in photography, there is room for difference of opinion, but the preponderance of opinion on the subject amongst those most capable of forming sound and comprehensive views, and of giving them effect, is at present in favour of such awards. We believe that honorary recognitions, whether ribbons, stars, garters, crosses, titles, or medals, have been and ever will be the best incentive to exertion in every department of life. The schoolboy with any character strives for the position of head of his class, strives for a prize at the examination. The soldier strives for a medal or a cross. The statesman for the garter. The initials F.R.S. are the proudest honorary distinction of the English *savant*, and so prized are the degrees of our recognised universities that we perpetually find the degrees of minor and unrecognized institutions, obtained by purchase or otherwise, paraded as honorary distinctions. The medal possesses a similar value to photographers, and we scarcely know an instance of one being obtained by an unworthy man, whilst the greatest number have certainly been obtained by our best men. In an art so young as photography, dependent for so much of its progress on patient endeavour in directions which cannot secure to the votary practical remuneration, such honorary recognitions are pre-eminently important as affording most valuable stimulus to exertion and excellence. If our correspondent has any good argument to urge against medals, we shall have pleasure in hearing it and giving it publicity. We have no objection to put his opinion on record as opposed to medals, but the record of opinions without reasons might easily become a troublesome as well as a profitless task. We have heard opinions against medals expressed before, but we have not found these opinions supported by arguments. Mr. Leake concludes by saying that although photographers may differ in opinion, they may "at least differ like gentlemen, and not call each other rogues and fools." We cordially agree with him, and can assure him that no one shall be permitted to exchange in our columns such "flowers of speech," as Mrs. Malaprop would phrase the terms our correspondent quotes.

H. X.—There are several causes for slowness, or the need for long exposure, but without much fuller information it is impossible for us to decide which is in operation in the case in question. A common cause is an ill-lighted room. A case recently came under our attention, in which it was impossible to assign a cause, until we saw a model of the studio, in which we found the glass roof was low, with narrow panes divided by deep sash-bars running transversely across the roof. The effect was, that a model standing for a portrait saw no sky, nothing but sash bars, thus proving that no direct light reached his head. Is your room well lighted? Are you using a lens of long focus and small aperture? If your room be well lighted, and the lens have a sufficiently wide aperture in relation to its focus, then an old and weak bath, or a very acid bath, or a contaminated bath, or old and insensitive collodion, may cause the slowness. Certainly, the time you name seems much longer than necessary. Clean your lenses, try a fresh sample of collodion or a new bath, clean the windows of your studio, remove some of the blinds. We can only aid you by such general advice in such a case. 2. The largest boy's head is a fine, round, well-modelled picture. We do not like, as a rule, pictures without definition. The work generally is pretty good, but some of the prints are very mealy. The doubles are not quite sharp, as they scarcely could be under the circumstances, but well arranged. The tendency to excessive cheapness is a heavy difficulty to deal with. It is difficult for us to advise, but our general advice is, maintain equitable prices. 3. We know many good photographers who never use the acetate bath twice, but this arises out of a scrupulous desire for uniformity of tone, which they fancy is less easily obtained by using a bath over and over. Many more continue using the same bath *ad infinitum*, merely strengthening from time to time, when the operation becomes slow. If the bath gets radically out of order from any cause, then make a new one. 4. If the hyposulphite bath be fresh and neutral, half an hour's immersion will do no harm; it may possibly reduce the print a little, but not always that.

M.—The fault is in your toning-bath, which has become decomposed from some cause, and the liberated chlorine has produced the bleached, mealy effect of your print. It is probable that you have used dirty vessels for the solution, or else touched it with dirty fingers. If your fingers had been in contact with hyposulphite of soda, and then came into contact with the toning solution, the effect you have described would follow.

Chris. (Llandudno.)—The character of the negative, the length of exposure, and the quality of the light, all more or less modify the colour assumed by a print in the printing-frame. But although, in the future operations, there is always a tendency in prints to retain in some degree the character of the tone they assume in printing, the colour of the finished result is very much in the hands of the operator. If you use a preliminary coating of albumen (which is altogether unnecessary), that will materially modify the character and colour of the finished picture.

Stereo.—If you register a stereo-slide, both halves will be protected, even if printed separately and of a larger size.

Thanet.—We have found prints occasionally become of a pink or purple tint right throughout the substance of the paper, when a little white light has reached them during the operation of toning. If an incipient reduction in the bath be present, the light will readily produce such a result.

J. Davis, Chemist.—We do not remember receiving any letter or enquiry from you regarding your roof. Write your questions again.

P. B. asks us if there be a new process for photographic printing. There have been several new processes recently,—the carbon processes, the relievo process, and the collodio-chloride process; but we cannot tell to which of these our correspondent refers.

J. Vaughan.—It is not imperative that prints should be carefully washed before toning; but if it be not done there is generally a waste of both silver and gold. 2. The gold in old toning-baths may be precipitated with protosulphate of iron. The gold will be thrown down as a black powder, and may be converted into chloride of gold by means of *aqua regia*. Any silver which may be thrown down with it will then be recovered as a chloride.

The North London Medals.—We have received, just as we were going to press, and too late for publication if we had desired it, two protests by disappointed exhibitors against the awards of the jury in the North-Eastern London Exhibition. We suppress the names of both for the present, because we think the terms and ground of their protests discreditable to them. One answers supposed objections to his contributions which the jury never made, expresses a conviction that the jurors were not qualified to judge, and then hopes they will reconsider their decision! The other is one of the richest pieces of egotism we ever met with. After expressing a doubt of the capacity and honesty of the jury, this precious protest proceeds, "We consider ourselves to be competent judges;" and goes on to intimate a conviction that the contributions for which the award was made were inferior to those of the writers of said protest, whose productions, according to the estimate they express, are of the "highest class." We havn't a doubt that they believe all this, and a great deal more; and no one can doubt the impartiality and disinterested character of their convictions. Badinage apart, however, we should not in any case think of publishing any such protests until the jurors have made public their report. If, after that, our correspondents still wish us to publish their protests, we shall give the subject our best consideration.

Photo. asks if it be necessary, in competing for a medal at an exhibition, that the photograph or negative should be the *bonâ fide* production, and property of the exhibitor or his servants, or can prints from negatives, the production and property of others, be exhibited for competition. We answer that something depends on circumstances. As a rule, there can be no doubt that a competitor would be debarred from all chance of a prize if he exhibit the productions of another. But if he be competing for a prize given for a printing process, it would not be important from whose negatives the contributions were produced. For instance, in exhibiting carbon prints, as carbon prints, it would be no barrier to legitimate competition that the negatives were not produced by the printer.

Ben Lomond.—We think the circumstance you describe altogether cruel and unjustifiable, and, we believe, illegal; but of that we are uncertain. We will write to you if we can find time.

J. R.—We do not know where the Berlin reproductions of Sala and Co. are to be had in this country. Marion and Co. publish some very fine reproductions; also Mr. Hering, of Regent Street.

R. A. P. A.—Your proposed increase of light in your glass room seems very good. Your best plan in commencing to produce negatives will be to take a good work, and follow carefully its instructions. Mr. Hughes's "Manual of the Principles and Practice of Photography," "Practical Photography," by Negretti and Zambra, or our own Year-Book, will furnish you with definite formulæ, which you can work out carefully. We shall have pleasure in helping you from time to time in cases of special difficulty with which you may meet. But, as you will readily see, to give detailed formulæ in this column would occupy more space than we have to spare for all our correspondents.

T. H. Redin.—The small perforations, which are in reality reticulation, arise from the presence of too much water in the collodion. The spirit has not been sufficiently highly-rectified with which the collodion has been made. It may be that you cannot find any remedy but a new sample; but it is not improbable that by keeping the plate longer out of the bath after coating with collodion before immersion, you may improve matters. That in which the film has left the plate arises partly from the nature of the collodion and partly from the cloth with which the glass received its final polish having been damp. This, with a very thin collodion, has produced the defect in question. Thanks for the enclosed portrait.

A Beginner.—A good developer for positives on glass may be made as follows:—Protosulphate of iron, 20 grains, glacial acetic acid, 20 minims; nitric acid, 1 minim; water, 1 ounce.

Photo-Sculpture.—Mr. David Gay writes to say that his specimens of photo-sculpture were not turned out of the Photographic Gallery at the Agricultural Hall, as alleged in "Echoes of the Month" in our last. He says:—"The fact is simply this: I sent a few photo-sculpture busts up to the Exhibition, when Mr. Hislop (whom I was given to understand had the management of the Photographic Department) saw them, he asked me for more, and said that if I would, he would give me a stand in the centre of the gallery. I expressed then a wish to have them downstairs, but was willing to give them a trial there. After being there a few days, I found so few people about, that there was nothing for my attendant to do, it being necessary to have an attendant (not a touter) to explain so novel a process as photo-sculpture, and I again expressed a wish to have them in the body of the Hall, in fact, told the secretary that I should remove them from the building entirely unless I could do so. So much for the committee being glad to turn them out. With regard to the advertisements of the price of carte portraits, they were never on the busts at all, but in a case of portraits which was hung at the back of my stand. When I exhibited it was with the intention of advertising my business, to which the committee never objected, and the case remains as it was!" We allow Mr. Gay to make his own statement; but we must add one or two comments. On receiving his letter we enquired of the chairman of the committee as to the circumstances, and find that our contributor's statement was substantially in accordance with facts. It seems that on account of the objectionable advertisements appended, and some other encroachments, the chairman had resolved upon the removal of the stand altogether; before he could take steps in the matter, an appeal was made to him for permission to remove the specimens, to which he replied that unless they were removed by Mr. Gay's people, he (the chairman) would certainly have them removed himself without delay. Mr. Gay is sadly in error in fancying that he could have removed anything contributed to an exhibition because he could not choose his place. When once the contributions are sent in they are entirely under the control of the committee, and cannot be removed without permission. In reference to the question of advertisement, it is clear that Mr. Gay quite mistakes the purpose of such exhibitions. He says he exhibited with the intention of advertising his business. That certainly is not the intention with which he is permitted to exhibit. Exhibitors obtain publicity as a subsidiary advantage; but on what ground he can imagine that a number of gentlemen undertake an immense amount of gratuitous labour and expense, and (some of them) render themselves liable as guarantors for some thousands of pounds, for the purpose of gratuitously advertising any man's business, we cannot understand. If everyone had followed Mr. Gay's example, the exhibition would not have been a display of art, but a huge advertising bazaar, illustrating the worst phase of competition, that, not of excellence, but of that miscalled cheapness which has already done much to ruin the profession of portraiture.

B. A. L.—The statement that Dr. Hill Norris was the first to use tannin as a preservative in dry plate photography is correct, and is one easy of verification. In a communication in the *Photographic Journal*, Dec. 22, 1856, Dr. Hill Norris lays down a theory that the great object in preparing dry plates should be to keep the film in a condition readily permeable by aqueous solutions, and mentions as suitable for this purpose a variety of substances which he has tried. These substances are "albumen, gum, dextrine, starch, gluten, mucilage, sugar, *tanno-gelatine*," &c. The first announcement of Major Russell's tannin process was made, if we remember aright, in the sixth edition of Hardwich's "Manual of Chemistry," dated January, 1861. The process had then been in existence some months as Major Russell, in a communication in our pages in March, 1861, states that he had been experimenting with it for nine months. It is very probable that the value of this photographic use of tannin was with Major Russell an independent discovery, as he had several years before described the action of gallic acid in conferring certain good qualities on collodio-albumen plates, and it was probably from the use of gallic acid that tannin was suggested. In any case, there is not a shadow of reason for doubting that the tannin process belongs entirely to Major Russell, his labours in perfecting it would alone give him that claim, and we have no disposition to dispute it. That he should have forgotten himself in some recent letters is no reason why we should do him injustice in regard to his process. The term empirical, as applied by M. Poitevin to Major Russell's employment of tannin, simply implies that the process was based upon practical experiment, rather than upon a scientific knowledge of their properties. This is probably true, but it is not necessarily desparaging. Almost every discovery in photography has been empirical; facts have always been in advance of theory.

An Enquirer.—A French camera will answer your purpose, but will not probably be so well made as an English one. There is a disadvantage in using a whole-plate lens for card partraits. A half-plate lens may be used, if your studio be long enough; for, of course, the longer the focus of the lens, the longer must be the room. For a half-plate lens you would probably require a room of at least 26 feet long.

Lux.—With such a balance of advantages as you describe, you alone can make your own choice; a constant north light will certainly give you the least trouble in lighting; but a good range and a studio on the ground-floor will certainly have many conveniences. If you choose the aspect in which sunlight is inevitable at times, do not use ground glass, as that will shut out an enormous amount of light, and the sun does not shine every day in this country. A movable blind of tracing-cloth will keep out direct sunlight without materially injuring illumination, and the sunlight admitted through such a medium will often give fine effects. We will write.

Photographs Registered during the Past Week.

W. Woodward and Co., Chapel Bar, Nottingham,
Two Photographs of Silver Epergne, presented to Lady Clifton, of Clifton Hall, Notts., by the ladies of Nottingham.

Appleton and Co., Horton Lane, Bradford,
Photograph of Rev. W. M. Punshon, M.A.
Photograph of Rev. S. R. Hall.
Photograph of Rev. Wm. Arthur, M.A.
Photograph of Rev. Samuel Coley.
Photograph of Rev. Wm. Shaw.
Photograph of Rev. F. Greaves.
Photograph of Rev. Bishop Janes.
Two Photographs of Rev. G. T. Perks.

Mr. J. R. Netherton, Lemon Street, Truro,
Photograph of Truro from Kenwyn Churchward.

Mr. Jas. Andrews, Royal Institution, Swansea,
Photograph of a Dog seated, pipe in mouth.

Mr. H. Herlon, North Parade, Bradford,
Photograph of Capt. S. Robson, Bradford, A.V.

Mr. C. M. Dravson, George Street, Canterbury,
Two Photographs of Archdeacon Croft, of Canterbury.

H. and J. Waltrr, Broad Street, Lyme Regis, Dorset,
Two Photographs of J. C. Hawkshaw, Esq.

Mr. E. Caswell, Regent Street, Leamington,
Two Photographs of Engravings of Holbein's Picture of Henry VIII. granting Charter to the Barber Surgeons.

THE PHOTOGRAPHIC NEWS.

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BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Another of the annual carnivals of science, instituted five-and-thirty years ago by the British Association, is just concluded, the meetings having been held in the Midland metropolis, the great centre of industry, where congregate the workers in brass and iron, and precious metals. In numbers, funds, and sensational episodes, this meeting of the Association has been less successful than many others. There has been no illustrious stranger to lionize, no grand discovery to herald. Anthropologists, ethnologists, and geographers have been peaceful: no verbal duel has been expected, and no unexpected fracas has occurred. Nevertheless, the meeting has been a highly satisfactory one. The weather has been exceedingly fine, the district was rich in places of interest, in visiting which science and pleasure could be combined. The inhabitants have given visitors a cordial welcome, manufactories have been readily accessible to visitors, and hearty private hospitality abounding. Besides its attractions as the home of much of the representative industry of England, the place had associations too, which gave it a peculiar interest to an assemblage of scientific men. The opening words of the inaugural address of the president gave graceful expression to the memories that belonged to the place. "Assembled," he said, "for the third time in the busy centre of industrious England, amid the roar of engines and the clang of hammers, where the strongest powers of nature are trained to work in the fairy chains of art, how softly falls upon the ear the accent of science, the friend of that art, and the guide of that industry! Here, where Priestley analysed the air, and Watt obtained the mastery over steam, it well becomes the students of nature to gather round the standard which they carried so far into the fields of knowledge. And when, on other occasions, we meet in quiet colleges and academic halls, how gladly welcome is the union of fresh discoveries and new inventions, with the solid and venerable truths which are there treasured and taught. Long may such union last; the fair alliance of cultivated thought and practical skill; for by it labour is dignified and science fertilized, and the condition of human society exalted!"

Whilst there was no lack of excellent papers on a variety of subjects, on matters related directly to photography we never remember a greater paucity of matter. With the exception of Mr. Claudet's paper on a photographic application of the phenakisticope, in which he described an ingenious plan of giving the effect of figures in motion, by bringing under one eye in the stereoscope a figure in the first act of a motion, and then rapidly bringing under the other eye a second figure in the second stage of the same action—there were no papers devoted especially to photography. Mr. White's paper on the Magnesium Light, in connection with which he exhibited Professor Piazzi Smyth's photographs of the interior of the Great Pyramid, had, however, an especial photographic interest. The photographs exhibited were transparencies, and represented different views of the interior, with the measuring rod placed in different positions to give an idea of size and space. In all the prints there was a feebleness and fogginess, the result of the smoke generated by the burning magnesium, which considerably marred the effect, and suggested the importance of some plan for condensing, consuming, or otherwise getting rid of these fine particles of magnesia, which rapidly fill the atmosphere during combustion. We understand that Mr. Hart has invented a contrivance which will effectually get rid of this trouble; we hope its application will be speedily made and tested. In one of these pictures an attempt had been made to obtain an instantaneous effect by firing a mixture of gunpowder and magnesium, but the firework effect of the streams of fire was the chiefly noticeable point in the picture. Nevertheless, whilst little of pictorial character belonged to these photographs, they illustrated a great possibility in our art, which had thus compelled these dark and mystic photographs to render up and register on the sensitive tablet the interiors which have for so many centuries been hidden from the sight of the sun. Some brief but interesting discussion followed the reading of the paper, all tending to point out the value of the metal.

Mr. Owen Rowland's interesting paper on Parkesine contained also some important facts of especial interest to photographers, as describing a material for the manufacture of photographic vessels, light, rigid plastic, enduring, and absolutely resisting the action of almost every kind of chemical solution. A paper read by Dr. D. S. Price had also some photographic interest as illustrating very fully the action of light on white lead in the presence of sulphurous agencies. It was found that white lead paint did not blacken under the action of sulphuretted hydrogen except in the dark, sunlight producing a counteracting or bleaching action. It was found, moreover, that a piece of wood painted with white lead and then submitted to the action of sulphuretted hydrogen until it had acquired a very dark colour, recovered its whiteness when subjected to the action of light. The effect of covering portions of the darkened paint with coloured glasses was the production of a definite series of greys, lighter or darker in direct proportion to the amount of light admitted through the glasses.

Photography also played its part in the soirées held on various evenings. Mr. Skaife was busy with his pistol camera, a momentary flash of the magnesium light, a snap of the trigger, and the miniature portrait of the careless wanderer in the crowded soirée was secured for ever, if such a term may be used in regard to anything our art has yet produced. Photographs, photographic enamels, photomicrographs, Mr. Breese's transparences of beautiful instantaneous negatives, all added to the attractions of the soirées. Amongst Mr. Breese's pictures, which attracted crowds of admiring visitors, were some of those well-known, and a few new ones. Amongst these we may mention as at once wondrous and beautiful an evening scene, with the crescent moon and the evening star most beautifully rendered; and another with the gibbous moon exceedingly effective. Mr. How's display of Dr. Maddox's photographs of microscopic objects shown in the magic lantern excited much interest. Mr. Joubert's fine enamels were much admired, as were also a number of smaller ones resembling those of Camarsac in general effect, exhibited by Messrs. Roberts, Dale, and Co., by Obernetter's process. These, from the explanation of Mr. Dale, are by a process in many respects very nearly resembling that patented by Mr. Joubert. The magnesium light also played its part in the soirées, as it did in the street sights; some balloons, sent up on Monday evening to burn the wire, by Mr. Mather, illuminating the country for miles round, and giving sufficient light to read the newspaper when the balloon was a mile high. Mr. A. G. Grant also exhibited at the soirée a number of excellent interiors of lead mines he had taken with this light, and Mr. Brothers exhibited some portraits obtained by the aid of magnesium.

Some of the papers read at the meetings of the Pharmaceutical Conference, which holds its meetings at the same time as the Association, contain matter of interest, as the purity of various chemicals, considered chiefly of course in relation to pharmacy, but as possessing incidental relation to photography, some extracts from them will probably interest our readers.

Each year that we attend these pleasant gatherings of the British Association, we are struck with the increasing interest and recognition of our art. Whether to illustrate other arts and sciences, or to gratify and instruct by exhibition of the varied beauties it is capable of depicting, photography becomes gradually more and more an indispensable adjunct in almost all gatherings connected with art and science. It is no longer a mere scientific toy, but takes its place amongst the agencies which are working out the great problem of the civilization and advancement of man. Once more we may quote the eloquent address of Professor Phillips:—

"To aid researches into the condition of celestial bodies, the new powers of light discovered by Niepce, Daguerre, and Talbot, have been employed by Bond, Draper, De la Rue, and other astronomers. To our countrymen, in particular, belongs the honour of successful experiments on the rose-coloured flames which extend from certain points of the sun's border, during an eclipse; as well as of valuable contributions through the same agency, to that enlarged survey of the physical aspect of the moon, which, since 1852, the Association has striven to promote. By another application of the same beautiful art, in connexion with clockwork, the momentary changes of magnetic force and direction, the variations of temperature, the fluctuations of atmospheric pressure, the force of the wind, the fall of rain, the proportion of ozone in the air, are registered in our observatories; and thus the inventions of Ronalds and his successors have engaged the solar rays in measuring and comparing contemporaneous phenomena of the same order over large parts of the globe—phenomena some of which are occasioned by those very rays."

We add a few more of the eloquent words of the president to conclude:—

"Even radiant light in the language of the new Philosophy is conceived of by Maxwell,[*] as a form of electro-magnetic motion. And thus the imponderable, all-pervading powers, by which molecular energy is excited and exchanged, are gathered into the one idea of restless activity among the particles of matter:—

. . . æterno percita motu:

ever moving and being moved, elements of a system of perpetual change in every part, and constant preservation of the whole."

"What message comes to us with the light which springs from the distant stars, and shoots through the depths of space to fall upon the earth after tens, or hundreds, or thousands of years? It is a message from the very birthplace of light, and tells us what are the elementary substances which have influenced the refraction of the ray. Spectral analysis, that new and powerful instrument of chemical research, for which we are indebted to Kirchhoff, has been taught by our countrymen to scrutinize not only planets and stars, but even to reveal the constitution of the nebulæ, those mysterious masses out of which it has been thought new suns and planets might be evolved—nursing-mothers of the stars. For a time, indeed, the resolution of some nebulæ, by the giant mirror of Lord Rosse, afforded ground for opposing the speculation of Herschel, and the reasoning of Laplace, which required for their very starting-point the admission of the existence of thin gaseous expansions, with or without points or centres of incipient condensation, with or without marks of internal movement. The latest results, however, of spectral analysis of stars and nebulæ by Mr. Huggins and Professor W. A. Miller have fairly restored the balance. The nebulæ are indeed found to have in some instances stellar points, but they are not stars; the whole resembles an enormous mass of luminous gas, with an interrupted spectrum of three lines, probably agreeing with nitrogen, hydrogen, and a substance at present unknown.[*] Stars tested by the same accurate hands are found to have a constitution like that of our own sun, and, like it, to shew the presence of several terrestrial elements—as sodium, magnesium, iron, and very often hydrogen. While in the moon and Venus no lines whatever are found due to an atmosphere, in Jupiter and Saturn, besides the lines which are identical with some produced in our own atmosphere, there is one in the red, which may be caused by the presence of some unknown gas or vapour. Mars is still more peculiar, and enough is ascertained to discountenance the notion of his redness being due to a peculiarity of the soil."[†]

The next meeting of the Association will be held at Nottingham, under the presidency of Mr. W. R. Grove, Q.C., F.R.S.

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A JOURNEY IN SEARCH OF FOOD FOR THE CAMERA.[‡]

BY A LAZY CONTRIBUTOR.

The shrill whistle of the steam-boat informs us that our time is up, and we reluctantly descend to the pier. The few hours on shore have gone like minutes, but we console ourselves with the thought that it will not be long before we see further into the beauties of this charming place. Our last impression of Ventnor from the sea is very peculiar. The day is not so fine, and the clouds are mustering forces preparatory to an attack on us. The skipper and his men know how it will end before it begins, and are incasing themselves in armour of oilskin.

The tops of the big hills at the back of Ventnor are cut off and shut out from sight by the dark grey clouds; but the town beneath is still visible, and the whole effect is not unlike the last peep of a beautiful landscape at the theatre as the curtain is descending. We do not go close in shore on passing Shanklin, and as everything at a distance is rapidly assuming an uniform grey, our impressions are not favourable ones of this really beautiful place. Sandown is now before us, and the Culver cliffs very near. We are much impressed by their appearance, for they are the counterpart of the chalk cliffs at the entrance west of the island, and only require the Needles running out into the sea to make the resemblance complete. The Culver cliffs form the east end of the island, and present all the peculiarities of the cliffs in Alum Bay—the same sudden cropping up of the chalk to a considerable height, and the same variegated strata resting against it. It would appear from the strong resemblance between the eastern and the extreme western parts of the island that the chalk ridge runs through the island from the east to west, and may not inaptly be called its back bone. After passing the Culver point the land gently slopes away, and we have a flat shore all the way to Ryde. The rain now begins in earnest, and we see no more until we land at our journey's end.

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[*] *Proc. of Roy. Soc.*, 1864. The elder Herschel appears to have regarded the light of the sun and of the fixed stars as perhaps the effect of an electro-magnetic process—a perpetual aurora.

[*] *Proc. Roy. Soc.* and *Phil. Trans.*, 1864.

[†] *Phil. Trans.* 1864.

[‡] Continued from p. 402.

We determine to see more of Shanklin, and go there by rail from Ryde. Again we are puzzled by the absurd sensation of getting to our journey's end almost before we have well taken our seats. The island must be very small, and yet we were some hours on board the steam-boat when making the journey between the two places.

The village of Shanklin is a most delightful spot, and the photographer, when he passes this way on a visit, would do well to have in good trim a large stock of glasses, for he will find plenty of subjects, all within a stone's throw of each other. Very quaint is the principal street, if street it may be called, for there appears but one main road through the village, on its way to some other place; and a few old-fashioned houses have been turned into shops to meet the new requirements of this rapidly growing bathing spot. Indeed, so quaint is Shanklin village altogether, that it just borders on the absurd. Imagine the principal hotels with thatched roof, and eaves so low that we could almost touch them, and trees overhanging the chimney-tops, and, besides this, ample lawns and plenty of flowers, the windows all shut out from view by them, and you have a fair type of the place. Look in which direction you may, thatched roofs and dormer windows, with masses of trees and abundance of flowers, will meet the eye. As we near the sea we lose all these peculiarities, and the regulation sea-side villa or cottage, with its balcony and bow window and green Venetian blinds, takes the place of the genuine villager's home.

When we get on the beach we are not at all surprised at the rapidly-growing reputation of this delightful spot, for a more enchanting bathing spot it is almost impossible to conceive. It is a calm day, and the sea rolls lazily in clear as crystal, and over sand hard and golden. The shore sweeps round with a graceful curve which terminates at the extreme point of the Culver cliffs, and forms a bay more beautiful than any it has been my lot to see. In the hollow is Sandown, basking in the almost tropical heat, and it appears to have reached nearly the melting point, for the houses look white hot, and the eyes are so dazzled that they turn with pleasure to the grateful green of the undulating sea. The cliffs are very high here, and are cleft in twain, forming the very famous Shanklin Chine. The view from the beach is very beautiful. The sides of the gap are covered superabundantly with verdure, and at the bottom is situated a cottage protected from the inroads of the sea by a narrow esplanade formed with piles. A small clear pool is formed by the constant action of the water which runs down from the Chine, and in it is reflected, as in a mirror, the house and trees beyond with the piles apparently deep down, giving altogether a fictitious depth to this very diminutive lake. I have seen somewhere a very pretty picture of Shanklin Chine, by Leitch, I believe, but so unlike the real spot that I had at first some difficulty in believing that I had got to the best view of the Chine. In his picture there was the self-same cottage with the homely path, a few fishermen's boats in the foreground, and, high up in the gap, an important stream of water tumbling down an immense distance, and lost to view in the mass of verdure below. The water formed so striking a feature in the view, that I felt certain I ought to see it, and that the fault was mine. Could it be that the tide was not low enough? I waited until the tide was quite out, but no water was to be seen. True, it was dry weather, but the watercourse was not visible even. I suppose it must be considered a painter's licence, but in these days of pictorial truth it seemed scarcely justifiable that because near at hand, when stationed at its foot, this peculiar stream is easily seen tumbling down from the rocks above, that therefore this striking peculiarity should be introduced into a general view, taken from a point where it is entirely shut out from sight. I call to mind at at this moment a charming little photograph of this spot by Mr. Russell Manners Gordon, exhibited at Conduit Street this year. This little photograph, without sacrificing an atom of truth, is one of the most artistic pictures yet done by photography, and may claim fearlessly to be placed by the side of its more ambitious rival.

The fee is now paid to the Cerberus who guards the entrance to the Chine, and, eager to look closer into its hidden beauties, we wend our way up circuitous paths delightfully cool, for the sun is shut out by the overhanging trees. A lovely spot, truly, and by no means disagreeable to prosaic old married folk. The foot of the fall is at length reached, and the general feeling is that of disappointment. So much has been said and written about the famous Shanklin Chine, and such grand, flowery descriptions given in the guide-books, that possibly the imagination had been too busy. Guide-books had talked of foaming torrents cutting mercilessly through the resisting rock, and we saw a small thread of water, which, falling down some thirty feet, certainly made a little noise, and suggested at once a notion that some one above had a moment ago overturned a pail. The whole spot might fairly be called pretty, but the grandeur we had been led to expect was absent.

With the exception of the one photograph we have mentioned, we do not think that Shanklin has received justice at the hands of photographers, for most certainly the pictures sold on the spot fail very much, and have many shortcomings when tried by our art standard.

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MOVING PHOTOGRAPHIC FIGURES.

Illustrating Some Phenomena of Vision Connected with the Combination of the Stereoscope and the Phenakisticope by Means of Photography.

BY A. CLAUDET F.R.S.*

From the beginning of photography it must have struck many of those who were acquainted with the phenomenon illustrated by the phenakisticope invented by Plateau, that photography could produce with advantage the series of pictures used in that instrument, on account of their possessing a greater degree of accuracy than when made by hand. At a later period, when the stereoscope had become popular from its application to photography, there must have been a still stronger incitement to make use of that process to produce binocular pictures for the phenakisticope, in order to combine the stereoscopic effect to the illusion of moving figures elicited in the phenakisticope. For example: if a number of binocular photographic pictures were taken of a machine in various consecutive stages of its motion, these pictures, applied to a phenakisticope, would give a complete illusion of the machine in perfect relief and in its full action.

Binocular pictures of persons dancing, fencing, or boxing, of acrobats at their wonderful feats, of boys playing at dfferent games, all in the various stages of the action of each sport, representing consecutively the whole performance, such pictures might have been supposed to be invaluable to exhibit the stereoscopic illusion of persons in the real action of life. Therefore, the solution of such an interesting problem was capable of exerting the emulation and the ambition of many ingenious and scientific minds.

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* Read at the British Association, on Thursday, Sept. 7th, in Section A.

Among those who undertook the task, M. Duboscq, the eminent optician, of Paris, was the one who attained the greatest success. He had fixed the two series of binocular photographs on two zones of the revolving disc of the phenakisticope one above the other, and by means of two small mirrors, placed each respectively at the inclination capable of reflecting the two zones, on the same horizontal line, from whence the images could each separately meet the axes of each of the two prismatic lenses of the stereoscope. In this manner, during the revolution of the disc, each eye had seperately the perception of one of the series of photographs, each showing the perspective of one eye, and the stereoscopic effect of figures in motion was consequent.

M. Duboscq gave another form to the phenakisticope. Instead of the vertical original revolving disc of Plateau, he employed a cylinder revolving on its vertical axis, and he placed on two inside zones of that cylinder, one above the other, the two series of photographic pictures between the slits through which the eyes can see the pictures, and by means of two mirrors, as in the other apparatus, each series were reflected on its respective lens through the cylinder, and the stereoscopic effect was produced in combination with the phenakisticopic effect.

However, these two attempts of M. Duboscq did present a few imperfections, which we are going to explain. In the revolving disc the two series of pictures do not move with the same velocity, on account of their being placed on two zones of different peripheries, and this produces a sort of confusion and distortion in the representation of the object during its movement. The same defect exists in Plateau's phenakisticope in the perception of its single series for the top and bottom parts of the figures, owing to the cause explained, revolving in different velocities, are not impressed in the retinæ during the same time, and the blank spaces between the pictures, being larger for the top than the bottom part, give a stronger sensation of void during the visual perception of the pictures.

In the revolving cylinder this defect does not occur, but the picture, being considerably curved like the cylinder, is a most unfavourable disposition for examining them in the stereoscope. However, M. Duboscq's contrivances are very ingenious, and in his attempt he has succeeded at all events in proving the possibility of solving the problem.

About that time I had also turned my attention to the subject, and found some difficulty in obtaining at once the phenakisticopic and the stereoscopic effects, in avoiding the defects I have alluded to. However, as I am far from considering the case to be quite desperate, I intend to resume my researches as soon as I have leisure to do so. What gives me some hopes of success is the attempt I made some years ago. The result has been incomplete and imperfect, but if I have not succeeded in obtaining at once the motion and relief, I have gone so far as to shew figures which appear really to be in motion, and preserving all the correctness and distinctness of the photographs.

My ambition to obtain the stereoscopic effect with the movement of the figures having (I hoped only momentarily) been foiled, and not being satisfied with partial success, I did not like to publish an incomplete attempt, and for this reason, till now, kept it only for the curiosity of a few intimate scientific friends. But years are passing away swiftly, and as I do not feel at my period of life that I can reckon upon endless time and inexhaustible activity to complete many labours, I did not like to let another meeting of the British Association pass without availing myself of the opportunity of bringing before this annual scientific congress a very simple contrivance, which, if I do not later succeed in solving the whole problem, will, at all events, perhaps, call the attention of others to the subject, and induce them to try their hands and brains at its solution.

This is one of the many instances of the advantages of the British Association. Once a year all the branches of science of the world are brought together to shew the progress made, and point out the progress to be made. All the devoted followers of those sciences consider that they are obliged to contribute their mite, however small it may be, to increase the general interest of the meeting, and to awaken the desire for further improvements and new discoveries.

As it will be seen by the instrument I submit to the meeting, it is very easy to obtain the illusion of moving figures, but without stereoscopic effect. In this instrument, my first object having been only to try the principle, I have constructed it in the simplest form capable of showing the motion of the figure, and I have found that only two pictures are sufficient to elicit the phenomenon, although the illusion of reality suffers from the abruptness of two extreme movements, and from the deficiency of intermediate positions.

But nothing is so easy as to employ eight different pictures in as many different stages of the action; and, with this number of pictures, the effect will be sufficiently complete. For this, having placed in the stereoscope two separate cubic frames, revolving independently on the same horizontal axis, I have only to fix on their four sides at right angles two sets of four pictures, making eight pictures, which are made to pass in consecutive order one after the other before the lenses of the instrument, and the figure will appear to assume consecutively eight different stages of the whole action. The instrument in its simple state, with only two pictures, will suffice to illustrate the principle, and, at the same time, to elicit some curious phenomena of the perception of vision.

It is known that the retina has the power of retaining for a short time the impression or the sensation of the image which has struck it. Now, availing myself of this property, I have constructed the instrument in such a manner that, by means of a slide with one hole, I can, by moving it rapidly in a reciprocating horizontal direction, shut one lens while the other remains open; and in continuing that motion, while one eye sees one of the two pictures, the second eye cannot see the other picture.

Now, if before the sensation of one eye is exhausted, the slide shuts the lens and opens the other, a new impression is produced on the retina, and we have an uninterrupted sensation of vision, as if the object had moved before us; and if a sufficient number of pictures represent that object in the various consecutive positions it has assumed during several stages of its motion, we experience on the retina the same sensation we have when we see the object itself while it is moving, and although the pictures in their limited number do not, and cannot, show all the intermediate positions of all the stages of a continuing action, still the mind has the power of filling up the deficiency, as it does if, when looking at a real object in motion, we accidentally wink the eyes, or an obstacle happens to pass before us and the object; although during that short interval we have lost the perception of a certain progress of the action, the mind has, as it were, guessed and represented to itself what ought to have taken place during the winking of the eyes, or during the intervention of the passing obstacle, and by that power of the mind there has been no interruption in the whole perception.

This is exemplified in the most forcible manner when we have only two pictures to look at alternately—one with the right and the other with the left eye, as it is with the instrument I have constructed for my experiment. One of the pictures represents the beginning of an action, and the other the end of the same action. By moving the slide one way the right eye can see the picture representing the figure in one position, and the picture showing the other position is invisible to the left eye. Now, by moving the slide the other way, the left eye sees the figure in the second position, and the first position is invisible to the right eye. Now, although we have only seen the figure in two extreme positions, one showing the beginning of the action and the other its end, still we have had the illusion of having seen the intermediate positions.

This is fully illustrated by the pictures representing two boxers. In one picture the arms and fists of one of the pugilists are near his body, as if he were preparing to hit his opponent; and in the other picture they are extended in the act of striking a blow. We have not seen the intermediate positions which the boxer ought to have gradually assumed during the whole fight, but we know that they must have taken place, and our mind completes the action. This mental perception is due to the sensation which we expect from habit and judgment, and we feel it as if it had been truly realized.

Another curious phenomenon is elicited by the alternate vision of the two eyes consecutively. We see the object without any difference or interruption, whether it is by the right or by the left eye. The ultimate sensation on the mind is the same from whatever eye it has been carried to the sensorium of vision. Whether the object be seen by the right or by the left eye the sensation is exactly the same, and we cannot even distinguish which is the eye that has had the perception; so that if, while we have both eyes open, an object is passing before us, or if we move the hand before the eyes in such a manner that it hides alternately the vision of one and of the other eye, we do not feel that the vision is passing from one eye to the other, and it is impossible to know by which eye we have had the perception.

This explains the reason why in the instrument I have constructed, which alternately shows a picture in one position to one eye, and a different picture in another position to the other eye, we have a single perception of an object in motion without being conscious that the two actions have been consecutively and separately perceived only by one eye at a time, and in turn by one and then by the other. The result is an uninterrupted perception of an object in motion.

Our sensation of vision is not in the eyes but only in the single sensorium of vision, to which both eyes convey their separate perception. We have an example of a similar physiological fact in the sense of hearing. Although we receive the sound from two organs in opposite directions, only one perception is felt by the mind: the two sensations, like two drops of water, the moment they reach each other, are resolved into one.

If I have encroached too much on the time of the meeting, I have to offer an excuse, which I hope will be kindly accepted. How is it possible to be short when one principle of science irresistibly leads us to another? And how can we stop when we begin to unfold the marvellous and innumerable expedients which the Creator has employed to make our senses perfect, and to help our intellect?

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RECENT APPLICATIONS OF MAGNESIUM.

BY W. WHITE.*

Last year magnesium was introduced to commerce; and since its introduction several attempts have been made to convert it from an article of curiosity and amusement into one of utility.

At Bath last autumn we brought it in wire, and blinded ourselves and dazzled our friends with its brilliant light. Shortly after, it was discovered that combustion was improved by flattening the wire into ribbon; and ribbon has almost superseded wire in the shops.

Magnesium so far has almost exclusively been regarded as a source of light, and the problem has been, how to burn it to the best advantage.

Lamps.—Assuming that wire or ribbon was the best form, the question narrowed itself to the contrivance of some apparatus which would pay it out at the precise rate of combustion.

Invention moves by easy steps. The first attempts were made by Mr. William Mather, of Salford, and Mr. F. W. Hart, of Kingsland, who each produced a lamp in which the wire was delivered by hand from a reel, and guided through rollers and a tube to the flame of a spirit-lamp, in order to avert the risk of extinction. To this lamp Mr. Alonzo Grant, an American, affixed clock-work; and, with this addition, it has met with considerable success.

The risk of sudden extinction was a chief difficulty in the early use of magnesium light, probably arising from some flaw in the wire—the presence of some foreign matter in its substance. As the manufacture has improved, and the wire assumed a degree of ductility unknown in samples a year ago, this difficulty has become greatly reduced, and especially in the case of the ribbon, which I have seen burn steadily for half-an-hour without sign of intermission. Perfect certainty of combustion (dispensing with the spirit-lamp) has been ensured by the use of a double strand of wire or ribbon—it being exceedingly improbable that the flame of both should go out at the same instant, and in the event of one being extinguished, it would be re-lit by the other. One of Grant's lamps, paying out a double strand, has burned for two hours without cessation; and it is only necessary that the reels of magnesium and the clock-work be enlarged to secure a continuous light for any requisite time.

Captain Bamber, R.N., of Clarence House, Jersey, has been making a variety of experiments in order to adapt magnesium to common use in mines, tunnels, and railways. His instrument consists of a mahogany box, about eighteen inches long, containing a series of small wheels (much resembling those of a musical box), and a drum, round which the wire is wound, and from which the burner is supplied at a rate proportionate to the revolution of the drum, whose action is governed by a regulator. The burner is enclosed by a powerful lens or "bull's eye." Captain Bamber exhibited this instrument one night lately at the Paddington Railway Station, and, though the thinnest ribbon manufactured was used, the time was easily read off a watch at the distance of 250 yards.

Something yet Wanted.—There is manifestly much more to be accomplished in the matter of lamps. We require apparatus whereby a hall or picture-gallery can be illuminated for the evening. This, one would say, should be effected by burning the magnesium overhead from the centre of the ceiling, but the disposal of the smoke and ash, consisting of pure magnesia, is the difficulty—a difficulty, however, which has only to be stated to be met and overcome. Already some ingenious mechanics are tackling it hopefully.

Magnesium Filings.—It is a question whether magnesium in filings has met with due attention. It would not be difficult to deliver a stream of metal as sand from an hour-glass into a jet of gas or other flame, and thus maintain a light with a certainty equal to that obtained by wire and clock-work.

Cui Bono?—"A very curious and beautiful light; but what is the good of it?" asks the practical man. As Franklin met a similar question in the case of electricity. "What is the good of a baby?" Magnesium is a baby; yet, though a baby, it has already given some pledges of its manhood. One of its early feats was taking a number of portraits at night with a precision and effect equal to sunlight. This done, it was at once suggested, Why may we not have photographs of caves, catacombs, crypts, mines, and of every dark and wonderful cavity?

Professor C. Piazzi Smyth.—One of the first to put this suggestion to the test was the Scottish Astronomer Royal. Probably all have heard something of the interesting controversy connected with the granite coffer—the *sanctum sanctorum* of the Great Pyramid. It was Professor Piazzi Smyth's great object to bring this mysterious coffer to light, and to dissipate for ever all uncertainty about it. This, with the aid of magnesium, he has accomplished. We shall shortly have a volume from his pen descriptive of his researches and conclusions, and illustrated with photographs. Meanwhile he has most kindly allowed copies of his photographs to be exhibited to the Association, and has favoured me with a few notes concerning them which I shall now read.

Photography in the Great Pyramid.—1st. The interior of the Great Pyramid did not prove a good space for developing the excellences of the Magnesium Light. The ventilating passages opened by Colonel Howard Vyse in 1837 have been completely stopped up with stones and sand by the Arabs. Hence the air in the interior of the Pyramid has no visible means of being changed or purified, and as the said interior is visited every day through six months in the year by numerous parties of visitors bearing candles, the oxygen is so deficient, and the carbonic acid so abundant, that my surprise is, that the magnesium burnt at all. It did burn, but in a languid sort of way, and the smoke it threw off remained suspended in the motionless air for twenty hours or more, so that only one picture could be taken in twenty-four hours. If a second was attempted, the illuminated smoky air intervening between the camera and the object desired to be pictured was the only result on the photographic plate.

2nd. My object was not pictorial or artistic photography (of which I have therefore nothing to show), but the application of photography to certain disputed and special parts of the interior of the Pyramid for the sake of scientific examination and measurement; and these objects *were* obtained, notwithstanding all the drawbacks of the place, which really seemed combined to frustrate the merit of the light.

3rd. One example of success is presented in the granite coffer in the King's Chamber of the Great Pyramid. According to the theory of the late Mr. Taylor, that coffer was a primeval measure of capacity, from whence is derived the hereditary Anglo-Saxon wheat-measure called the quarter, of which coffer it is the fourth part. Whilst, however, we know by Act of Parliament how many cubic inches are contained in four quarters English, there has been much doubt as to the cubical contents of the granite chest of the Pyramid. The measures of the French Academy in 1799 made it nearly 6,300 cubic inches greater than several English travellers had declared it to be, though they, again, by no means agreed with each other in subsidiary details. Now, however, by means of the Magnesium Light, we have a series of photographs of this coffer, with a system of measuring rods fastened about it,* showing the size inside and the size outside; and finally, the cubical contents being summed up, prove that the remarkable granite vessel *is* a measure of capacity equal with almost mathematical accuracy to four quarters English.

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* Read before the British Association in Section B.

A Revealer of Colours.—A peculiarity of the Magnesium Light is, that it leaves colours unaffected—that is, it displays them as in sunshine. This may be verified with agreeable effect by burning a piece of wire at night in a garden or conservatory, when it will be found that greens and blues, yellows and whites, reds, violets, and purples appear with perfect distinctness. This fortunate quality has led to the employment of the light by dyers and silk mercers as a ready means of settling questions as to shades of colour either at night or in foggy weather.

Alloys.—A variety of magnesium alloys has been made, but none so far with any obvious excellence. Some experimentalists have had trouble in preventing the combustion of the molten magnesium. An easy way of getting over this difficulty is by first melting, say the copper, and then, with pincers or otherwise, holding the piece of magnesium underneath its surface until it is dissolved. By practised and dexterous handling, molten magnesium is safely managed in closed vessels, but anyone may try his hand at alloys by the method described.

An alloy of lead and magnesium burns very well; but the best combustible result is obtained by the combination of zinc and magnesium. Alloys with zinc in the proportions of 5, 10, 15, and 20 per cent. are readily converted into wire, and burn steadily, giving out more smoke, however, and the light exhibiting less actinic power.

For common pyrotechnic purposes, these combinations of zinc and magnesium promise admirably: reduced to powder they supply a brilliant ingredient for rockets; and in the shape of wire, they form a simple and efficient fire work, cheaper, if less dazzling, than magnesium alone, and quite worthy of Guy Fawkes's day.

Captain Bolton's Opinions and Experiments.—To the utilization of magnesium no one has brought such experience and such resources as Captain Bolton. As is well known, he devised the oxy-hydrogen signal apparatus introduced to H. M.'s service some three years ago. The credit attached to this success would have tempted many a man into the position of an obstructive, but Captain Bolton having arrived at the conviction, based upon actual experiment, that the magnesium light possessed all the necessary attributes for a perfect naval and military signal light, equally with the electric and lime light, and with decided superiority over them in the grand requisite of handiness, he at once avowed his conviction, and set to work to apply its powers to the best advantage.

In the first place, in conjunction with Captain Colomb, he has succeeded in introducing magnesium powder into signal-lights for use in the mercantile marine. These lights are intended to burn on the port or star-board sides of vessels entering port during thick or foggy weather. They last 3, 5, or 8 minutes, and longer lights from 12 to 15, and are distinctly visible at a distance of eight miles. The cost is trifling.

The Mercantile Marine Association of Liverpool have lately recommended that a powerful red light be made as the signal for danger at night. This recommendation Captain Bolton and Captain Colomb have met, again, by the use of magnesium in powder. They have prepared a red light to burn about 15 minutes at a cost of 1s. 6d. It is visible in clear weather at a distance of 10 miles. The signal is now under consideration by the Association.

A greater interest, however, belongs to Captain Bolton's efforts to supersede the oxy-hydrogen light by the combustion of magnesium in simplicity, in wire or ribbon. His apparatus for this purpose is not yet complete, and until it is, it would be unfair to him to prejudice it by description. Suffice it to say, that he has succeeded in consuming or suppressing the smoke, and with a few more adjustments will accomplish clipping off the ash which gathers on the point of the burning strand of magnesium, and sadly dims its glory.

With all imperfections, Captain Bolton has found it easy to signal with magnesium from Shoeburyness to the *Great Eastern*, eight miles off; and from Portsmouth to St. Catherine's Downs, Isle of Wight, a distance of sixteen miles.

Supposing Captain Bolton should fully attain what he proposes, it will lead to the employment of magnesium in all the ships and lighthouses of Europe. Rid magnesium of its smoke and ash, and there is no light to compare with it in other respects.

Magnesium in America.—The manufacture of magnesium has been commenced in Boston, and from the men of Massachusetts, who are said as babies to lie awake and scheme improvements and patents in the construction of cradles, we are likely to hear of some novel applications of the metal. If the contest in which they were engaged had not so happily ended, we should have learned ere this a good deal about the utility of magnesium in war. We were startled in reading, last February, in *The Times* and other papers, that blockade-running was about to receive an unexpected check, for it had been found possible to remove the veil of night by the blaze of magnesium fire. In a rough way it may be said, that to us in England, novelty is a prejudice to be overcome, but to Americans, novelty is a recommendation.

Other uses for Magnesium.—All our talk has been of magnesium as a source of light; but surely it will be found capable of other applications. It is, perhaps, the most abundant metal in Nature. It rolls in the sea, and forms vast tracts of land. If, as some say, everything in creation bears reference to man, and was designed for his use, what a future there is for magnesium! Sir Humphry Davy was the first to give the hint of its existence, nearly sixty years ago: it is time that Birmingham converted that hint to practical purpose.

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NORTH-EASTERN LONDON EXHIBITION.

Report of the Jurors of the Photographic Department.

In presenting a report of their labours in the Photographic Department of this Exhibition, the jurors have much pleasure in noting the great excellence of the majority of the contributions. In some departments the uniformity of this excellence rendered the task of deciding upon the highest merit one which required much deliberation, and the jurors will feel it necessary, in stating their reasons for their awards, to qualify in some instances the degree of merit which they represent.

The following medals have been awarded:—

For the best Portraits, Mr. E. W. Foxlee.
For the best Landscapes, Mr. F. Bedford.
For the best Pictures from dry-plate negatives, Mr. J. Mudd.
For the best enlargements, no award.
For the most Artistic Pictures, no award.
For the best Instantaneous Pictures, Mr. V. Blanchard.
For the most important Invention, Mr. W. B. Woodbury.
For the best Camera, Mr. Meagher.
For great excellence in Lenses, Mr. Dallmeyer.
Ditto, Mr. T. Ross.

In deciding upon the award for the best portraits, the jurors had to distinguish between various degrees of excellence possessed by many highly meritorious contributions. The portraits by Mr. Foxlee, by Mr. Jeffreys, by Mr. Rejlander, by Mr. Whaite, by Messrs. Maull and Co., by Mr. Downer, and some others, all presented distinct points of merit, and were worthy of very high commendation. Some of the contributions just named possess qualities of a higher artistic order than the pictures to which the medal was finally awarded; but, in estimating the degree of merit in portraiture, the jurors felt that the size of the pictures, and the degree of technical photographic excellence attained, were considerations which, in an exhibition of this kind, demanded attention; and, in estimating the aggregate of good photographic qualities, it was decided by a majority of the jurors that this medal should be given to Mr. Foxlee.

In determining the best landscapes, the jurors had not much hesitation. With the exception of those of Mr. England, and those of Mr. Mudd, which claimed consideration on other grounds, there were no other landscapes, notwithstanding a goodly number of fine pictures contributed, which could compare with those of Mr. Bedford in all the qualities which constitute good landscape-photography.

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* The application of the measuring rods was a happy idea worked out by Joseph Sidebottom, Esq., of Manchester. He supplied Professor Piazzi Smyth with some large slices of an old organ pipe of Queen Anne's time, as the most unexceptionable stuff—thoroughly seasoned wood wherewith to make trustworthy scales.

In awarding the medal for the best pictures from dry plates the jurors had a very simple duty to perform, as there was practically no competition, the few other pictures from dry plate negatives by the tannin and other modern processes bearing no comparison whatever with the pictures of Mr. Mudd, by the collodio-albumen process, which is the oldest dry process in existence.

A great variety of enlargements, but few of any excellence, were contributed to this Exhibition; none were considered by the jurors sufficiently perfect to warrant them in awarding a medal. Difficulties of this kind were felt: one contributor, Mr. Smith, who exhibited a large bust of some brilliancy, tolerable modelling and definition, also exhibited several others which were wanting in these qualities. Several other examples of enlargement, having fair average excellence, were found, when they came under the attention of the jurors, to be exhibited, not by producers, but by agents or dealers, and were thus disqualified for receiving attention. Perhaps the greatest amount of general excellence was to be found in the numerous specimens of Mr. E. Aldis, produced by the aid of artificial light; but these did not reach a standard of excellence sufficiently high in the estimation of the jury to receive the reward of a medal.

In considering the award of the medal for the most artistic picture or pictures, the jurors were placed in a position which left them but little option in arriving at a decision. It was felt by the whole of the jurors, with the exception of one (who, from the circumstances of the case, could offer no opinion), that the compositions of Mr. H. P. Robinson were the most artistic pictures in the Exhibition; but these were exhibited by one of the jurors, and marked "not for competition." It was formally proposed, therefore, by the chairman, and agreed to:—

"That the medal for the most artistic picture or pictures should not be awarded, inasmuch as, of the pictures exhibited, those by Mr. H. P. Robinson unquestionably claimed the highest artistic position; and being marked "not for competition," as the work of a juror, they were ineligible for an award; the jurors would therefore somewhat stultify themselves if they gave the medal to any inferior pictures."

A medal for artistic excellence being thus placed at the disposal of the jury, it was suggested that a very important branch of the art, especially allied with its art-aspects, had not received consideration in the original offer of the medals, instantaneous photography having been entirely overlooked. The fine instantaneous stereographs of Mr. V. Blanchard, illustrating almost every phase of excellence in that difficult branch of photography, had however strongly impressed themselves upon the attention of the jurors whilst examining the contributions. It was felt, therefore, that there would be a great fitness in transferring the medal for the most artistic pictures to the best instantaneous pictures; and Mr. V. Blanchard received a unanimous award.

The next medal which the jurors had to consider was for an undefined object, having been left open with an especial view to give a discretionary power to the jurors of rewarding any discovery, invention, or meritorious novelty, examples of which might be contributed to the Exhibition. The jurors were here again placed in a dilemma by the fact that one of their number had contributed illustrations of a most important discovery, which he had recently given to the photographic world. They refer to the collodio-chloride process of Mr. G. Wharton Simpson. They felt generally that a process of this kind should claim their first attention in awarding this medal. The recognised disqualification of the works of a juror for receiving an award compelled a disregard of the claims of this process; and the examples of photo-relievo printing by Mr. Walter Woodbury, although wanting in certain perfections of finish incident to the infancy of the process, presented so much promise of important economic value and a future pictorial excellence, that it was unanimously felt that Mr. Woodbury had merited a medal.

In their examination of cameras and other photographic cabinet-work, the jurors have to note the results of a high degree of skill, care, and enterprise.* Nothing could surpass the excellence of the workmanship of Messrs. Ottewill, Collis, and Co. Scarcely inferior was that of Mr. Hare. But in their early deliberations the jurors had arrived at a conclusion that excellence of design and especial fitness for the necessities of the photographer, when in combination with good material and first-rate workmanship, would be most equitably rewarded with the distinction they had to confer; and it was for excellence of design, especially in combination with other good qualities, that the medal was given to Mr. Meagher. Pre-eminently as possessing the quality referred to, was a portable camera with folding tail-board, packing into small space, permitting the use of lenses of very short as well as of long focus without inconvenience, being readily adaptable to various purposes, without any sacrifice in convenience and suitability for its primary intention—a fault too common with cameras of the *multum in parvo* order. This camera may be used for taking a pair of stereoscopic pictures, for taking a pair of card portraits, or for one cabinet picture of 7½ by 5. The focussing screen is hinged, instead of detached; the shutter of the dark slide opens laterally instead of vertically, effectually protecting the plate from the entrance of light through the grooves of the shutter; whilst great rigidity and strength are combined with portability and lightness. Some of the cameras exhibited by other makers possessed many of these characteristics; but the most satisfactory combination of them was found, in the opinion of the majority of the jurors, in the camera just described.

In awarding a medal for the best lenses, the jurors had to consider what was implied in the phrase. As photographic lenses are employed for such a variety of purposes, and the qualities valuable in one application are useless or mischievous in others, it was clear that the term could not be regarded in any absolute sense. It was resolved, therefore, that high general excellence and fitness for a variety of purposes would best merit the approbation of the jurors. It was suggested, moreover, by the chairman, that as the commercial productions of the competitors would not probably be superior to those especially prepared for competition, the practical experience of the jurors with the lenses of the only two contributors would afford an excellent aid in coming to a decision, and might with great propriety, in this instance, influence them in making their award. An examination of the photographs contributed by each competitor as illustrations of the working of recently invented lenses was also very satisfactory. From a consideration, then, of the illustrative specimens exhibited, and of the practical experience possessed by the jurors of the majority of the lenses in competition, it was decided that two medals should be awarded, one to Mr. Dallmeyer and one to Mr. Ross, and each for great general excellence.

The jurors cannot conclude their report without making a few observations on some of the most meritorious of the pictures exhibited.

Amongst many excellent contributions in portraiture, one by Messrs. Maull & Co. is especially worthy of notice, taken direct on a plate about 20 by 16. Notwithstanding some falling off at the corners, probably due to the imperfection of the lens, this picture, a portrait of a lady, possesses some of the highest qualities of portraiture; it is delicate, round, and brilliant, easy in *pose*, and agreeable in expression. The portraits of Mr. Jeffreys have, although not invariably, a general harmony, solidity, and freedom from vulgarity, highly to be commended. A number of large portraits of eminent men, by Mr. Whaite, of Manchester, possess great uniformity of excellence. The portraiture and studies of Mr. Rejlander, many of which in this Exhibition possess the merit of novelty, display so much freshness of feeling and artistic capacity that the absence, in some instances, of an equal degree of technical merit is the more to be regretted. Many of the portraits of Messrs. Southwell Brothers are worthy of commendation; pre-eminently so, two portraits of Shaksperian characters, on plates 22 by 18, possessing an amount of artistic arrangement and technical excellence rarely met with in pictures of such size. Surpassing all others in some points of artistic arrangement is a series of small pictures by Mr. R. W. Downer, of Watford. The taste and skill in arranging groups and the general feeling for pictorial effect exhibited in these pictures cannot be too highly commended.

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* The jurors have to remark that, in the choice of material for cameras, none of the contributors had kept entire pace with the progress of the market in supplying suitable materials; and they felt some surprise that a material so light, rigid, and free from the tendency to buckle or warp, as the timber of a species of tulip-tree, known in the trade technically as "Canadian white wood," which has been found extremely valuable for coach-panels and similar purposes, was not to be found as applied to photographic cameras. On the authority of one of the jurors technically versed in such matters, they throw out this suggestion to manufacturers.

As displaying excellence of intention and, in many instances, skill in execution, the Jurors would call attention to the compositions and studies of Messrs. Twyman, Blanchard, Cooper, and Dr. Hemphill.

Commendable for many excellent qualities in landscape-photography are the contributions of Mr. F. M. Good, D. W. Hill, Nelson K. Cherrill, and of Mr. Braun (who exhibits two very fine large panoramic Alpine views taken with Johnson's pantoscopic camera).

Amongst novelties especially noteworthy are some examples of printing in collodio-chloride of silver on opal glass, by Mr. Noel E. Fitch; and some admirable examples, apparently by the same process, but not so described, by Mr. J. C. Leake. Mr. J. Stone exhibits two good examples of Swan's carbon process, and also two curious transparencies on paper produced by the action of light on gelatine and bichromate of potass.

In the apparatus department a valuable collection of photographic vessels in vitreous ware and iron-stone, by Messrs. Edwards and Son, of Dale-Hall Potteries, Burslem, excellent in design and material. deserve the highest commendation. The cases of chemicals exhibited by Mr. How, Johnson and Co., and by Messrs. Morson and Son, are well worthy of attention, as are also the fine examples of photographic glass exhibited by Mr. Goslett.

Hugh W. Diamond, M.D., *Chairman.*
G. Shadbolt.
W. Hislop.
G. Wharton Simpson.
H. P. Robinson, *Reporter.*

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THE RAISIN SUGAR PROCESS.

BY M. JULIUS SCHNAUSS.

Before covering my plates with collodion, I usually coat them with gelatine. We can, however, by other means, prevent the film from acquiring a tendency to come off the plate: for example, we can cover it with a film of caoutchouc dissolved in benzine, or rub the edges with a piece of grit-stone. It is not necessary to employ any special preparation either for the collodion or the silver bath. They must be such as will give a vigorous negative upon collodion. After sensitizing, the plates are placed in a dish of distilled water, in which they are moved frequently, and from which they are afterwards removed to be finally washed under a stream of distilled water; the back of the plate must be washed as well as the collodioned side. This done, pour at three several times on the collodion film a decoction made by boiling together for a few minutes—

Raisins . . .	2 ounces.
Distilled water . .	10 „

Filtering when cold.

As this solution decomposes very rapidly, no more than is required each day is prepared at one time. When the plates are covered with this solution, they must be again carefully washed (this is of very great importance), then left to dry in a place sheltered from dust, and of course protected from the light. With plates prepared in this manner, in a landscape stereoscopic camera, an exposure of one minute or a minute and a half is required: it is always better to over expose than under.

The alkaline developer, as recommended by Mr. Sutton, is the best. The plates are moistened with distilled water, then covered with a solution of bicarbonate of soda, one part salt to 500 parts of distilled water. When this solution has been spread several times over the film, it is decanted into a glass, and 20 to 25 drops of an alcoholic solution of pyrogallic acid, 2 per cent., added to it. When this liquid is again poured over the plate, the picture quickly appears, but is scarcely visible. This result obtained, the plate is carefully washed, adding to the washing water one or two drops of acetic acid, in order to remove every trace of alkalinity; then proceed to the strengthening. The best intensifier consists of a mixture of pyrogallic acid, citric acid, and nitrate of silver considerably diluted. Every experienced photographer will easily determine the proportions of this mixture. If it be desired to make the shades vigorous, the proportions of silver and citric acid must be increased; if we wish to obtain the opposite effect, we must increase the proportion of pyrogallic acid.

It is asked, and not without reason, if the raisins cannot, according to their quality, considerably modify the results afforded by this process? Experience has shown me that these modifications are inconsiderable, and that all raisins, whatever their origin, give very nearly the same results, which must be attributed to the small quantity of sugar which the raisins contain not being able, in consequence of the washings subsequent to the preparation, to exercise much influence.

All the constituent parts of the juice of the raisin are found in the water in which dried raisins are boiled. By cooling almost all the tartrates are deposited. For this reason the solution must not be filtered till it is cold; if we act differently, we shall see innumerable little holes appear in the darks of the negative: these little holes are caused by a deposit of crystals of tartrates. During the drying of grape, the sugar of the fruit is converted into glucose.

Upon testing, by means of chemical reagents, a solution furnished by dried raisins, we obtain only negative results, and recognise that the sugar constitutes the most important element of it; the liquid has, however, a slightly acid reaction.

Neutral nitrate of silver only slightly clouds this solution; but in the light the mixture blackens rapidly, in consequence of the reducing action exercised by the sugar. This shows the necessity of washing the plates after covering them with the solution of dried raisins, if we wish to avoid the negative becoming covered with brown spots. The salts of lead and the salts of iron give no appreciable reaction with this solution. We are also compelled to admit that it contains no tannin. Consequently, the action of the solution of raisins upon the plates remains thus far in a state of mystery, especially if we consider that washed plates not covered with this agent give only bad results, and that, on the other hand, all the qualities of plates treated in this manner are found annulled if the decoction is left in contact with the collodion film.—*Photographische Mittheilungen.*

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FURTHER REMARKS ON THE PRODUCTION OF SCARLET NEGATIVES.

BY M. CAREY LEA.*

The best and simplest method of preparing the plate to be acted upon by Schlippe's salt consists in chlorizing it in the manner which I have already described.

This method of bringing the metallic silver in a negative into a state to be acted upon by the re-agents subsequently to be applied will, I think, be found to have advantages over any other, even when Schlippe's salt is not to be used, but where it is intended to blacken the plate by alkaline sulphide. It consists in flowing the plate with a weak solution of bichromate of potash acidulated with hydrochloric acid. The treatment will in itself, especially if arrested in the earlier stages of its action, or at least if not allowed to run its full course, give considerable increase of density to the picture, and in many cases this may be sufficient.

When a negative has been treated with Schlippe's salt, the operator should bear in mind that a considerable change will take place in drying. The orange colour by transmitted light disappears, and a much darker shade sets in; the change is best appreciated by observing negatives which have dried at one end and are still wet at the other. The splendid scarlet shade by reflected light still remains after complete drying, and is the proper and characteristic colour of the picture, which appears to consist of sulphantimoniate of silver, not of precipitated penta-sulphide of antimony; at least the resistance which the picture exhibits to the action of dilute caustic ammonia leads to this conclusion.

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* From the *American Journal of Photography.*

In fact, the picture seems to be one of a very permanent character, and resists strongly the action of acids and alkalies. If the chlorizing mixture above described be applied strong or for some time to the negative *after* treatment with Schlippe's salt, it finally decomposes it, and seems to bring back the picture pretty much to the condition which it had prior to the application of Schlippe's salt.

Negatives which are already pretty strong and dense should not be forced with Schlippe's salt. There is a tendency in the parts which were originally strong and dense to become covered with minute reticulated cracks. This result I have particularly noticed when I have taken defective negatives, already of sufficient strength, to experiment upon.

It is a fact well known, especially to professional operators who make a speciality of copying, that if a picture originally pretty strong is forced too much, the fine lines exhibit a most unpleasant tendency to fill up, this even where the picture consists exclusively of black and white, with entire absence of half-tone. In some cases I have even seen the lines fill up so as to become actually *more* dense than the adjoining portions.

It is then a canon to be universally adopted, that where strong forcing is to be done for any particular purpose in view, the negative must never be over-developed. And it is best not to re-develop it, especially if the forcing is to be done with the sulphantimoniate. In such cases—say when it is intended to copy an engraving, and to render the whites of the original very dense in the negative, and yet keep all the lines—free, I advise—

(1.) Not to under-expose.

(2.) Develop with iron, keeping back with a large allowance of acetic acid.

(3.) No re-development, but a simple mixing and clearing, very thoroughly done, by leaving the negative in a pan of solution of hyposulphite.

(4.) Chlorizing with bichromate and chlorhydric acid.

(5.) Applying the sulphantimoniate in the shape of a bath, either in a horizontal or vertical vessel.

A negative treated in this way shows very beautifully and curiously when viewed as a positive by reflected light. Its surface acquires a peculiar brilliancy, quite different from anything that is obtained by any other process, and looking, especially in the denser parts, almost as if it had been burnished. This effect does not require varnishing to bring it out, but appears as soon as the plate is dry.

Although this, like most other energetic and effectual measures for re-enforcement, requires care to avoid filling up, yet it has no tendency to soil; the parts which were transparent previous to the appearance of the Schlippe's salt will be found to continue so afterwards; and the entire dispensing with mercury, and avoiding the uncertainty of permanency which results from its use, cannot be looked upon otherwise than as a notable advantage.

Although the scarlet colour is very beautiful, and extremely non-actinic, I think that in practice the russet shades will be found equally good, or even in some respects better. These are obtained by stopping the action of the chlorizing, or iodizing, or mercurial solution, whichever is employed, before its action is quite complete, and whilst the colour is either darkened by the first effects of the agent, or is intermediate between that dark colour and the very light one which marks the completion of the reaction. These russet shades, though less striking than the scarlet, are equally new to photography, and are exceedingly advantageous for printing.

I have also mentioned before that the solution of Schlippe's salt keeps much better by adding a few drops of liquid ammonia to it. The colours obtained in this way have not the brilliancy of some that the pure solution gives, but are equally effective for the end in view.

ON THE DURABILITY OF PHOTOGRAPHS.

BY S. R. DIVINE, M.D.*

By the term photographs in the caption we include all pictures made by the action of light, not limiting the scope of the word to the ordinarily accepted meaning of pictures on paper. A Daguerreotype made twenty years ago as brilliant and beautiful as on the day it was taken, calls up some sober reflections when compared with a carte de visite of the tender age of one or two years with the sallow complexion that indicates incurable disease and approaching dissolution. Is it not a strange fact that the first productions of the sublime sun-painting art should have been the most beautiful and delicate, and at the same time the most durable? We can recall no other case in which art or invention produced their most perfect works at first, and afterwards retrograded.

Photographs on paper are a convenience which the public seems to demand, although certain to be cheated with pictures that are not permanent. Look over the magnificent album that ornaments the parlour centre table, and observe how many pictures are in a fading condition, if not already spoiled by the effects of time. Surely, when an album photograph is the only portrait we have of a lost friend, we are cherishing a very frail memento, and we may find some day, to our sorrow, that the shadow has not long survived the substance. Photographers know this: what one of them would exchange a Daguerreotype of a dear relative for the best carte de visite ever taken? The public will know it, and at no distant day refuse to have any more such trash as they get now-a-days.

The collodion-positive, or ambrotype, had its day, and is still made to some extent as a cheap picture. It is very durable when carefully washed from the cyanide used in fixing, and may pass to posterity with the Daguerreotype. It pleases those who dislike the polished surface of the Daguerreotype plate. In case of doubt as to the permanency of the image when formed upon and within a collodion film, it would be quite easy to remove the pyroxyline by proper chemical solvents or by heat. In that case there is no reason why the picture should not be absolutely permanent, for the silver comprising it would rest upon the bare glass. It will be inferred from the foregoing considerations that the new "porcelain picture" has the conditions of permanency, so far as we know, when printed upon collodion and fixed with cyanide. But the opalotype is not likely to command extensive sale, on account of its greater cost and the difficulty of making it a pleasing picture without elaborate colouring.

There have been many attempts to produce carbon prints, more or less successful, but they can never take the place of those made with salts of silver so long as they are inferior in the sharpness and delicacy. It would be most desirable to make good photographs in carbon on paper, for we know that printers' ink is permanent. But there is an insuperable difficulty in making good printing-plates by chemical action, for the reason that chemicals will not cut in action like the instrument of the engraver. The principle of all processes of photo-lithography is the removal of soluble from insoluble matters by chemical solvents. Of course the action of light which renders the matter insoluble is very superficial, and when the solvents get below the surface, as is necessary to produce the relief required, it acts in all directions, and, by impairing the outlines, impairs the sharpness of the image.

New York, August 3rd, 1865.

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* From the *American Journal of Photography.*

Correspondence.

FOREIGN SCIENCE.

[From our Special Correspondent.]

Paris, September 13th, 1865.

M. Verneuil's presenting his enlarging apparatus to our Photographic Society was the occasion of an interesting discussion. The principle of construction in this instrument is not new. A small negative, or transparent positive, is obtained, and employed to produce a negative amplified from a quarter-plate to the dimensions of a whole-plate. If we operate in full sunshine, a piece of ground-glass serves to modify the intensity of the light. At about two inches from this glass place the *cliché* to be copied, the collodionized side next to the objective, which is generally a Dallmeyer's quarter-plate lens, with a diaphragm of about a quarter of an inch ; the back lens is next to the *cliché*, and the object travels on a board, which admits of its being adjusted between the *cliché* and the plate to be printed. It is indispensable that no ray of light passes into the camera placed behind the instrument, which must receive only the rays that pass through the objective. A double-bodied camera admits of the objective being removed further from the plate to be printed. The greater the distance the more the picture is enlarged. With a carte de visite *cliché*, and the objective described above, upon a clear day, and without the aid of the sun, we can obtain a negative enlarged to the dimensions of 20 to 24 inches in from three to five minutes' exposure. This *cliché*, thus obtained, is employed to print positives by the ordinary process. It is understood that the exposure may be materially diminished if the ground glass be applied, and the instrument be placed so that the *cliché* receives the direct rays of the sun.

The advantages of this instrument consist in enabling the operator at any time, without the sun, to readily obtain, in a short space of time, very small as well as amplified *clichés*.

By means of instantaneous negatives for the stereoscope we can also obtain transparent positives, giving relief without its being necessary to cut the negative in order to transpose the pictures.

M. Girard remarked that similarly constructed apparatus had been frequently brought forward, for it was in fact only an elementary application of the law of conjugate foci. The essentials of this apparatus could not therefore be regarded as new, although some of the details of construction might be so regarded. Mr. Harrison corroborated what M. Girard had said, by reminding the Society that five or six years ago Mr. Dallmeyer had presented a camera of this kind to the London Photographic Society. This camera was fitted with a *triplet* lens, one capable of giving a very flat picture. Mr. Claudet, who at that period was a warm partisan for the Woodward Solar Camera, proposed to take an enlarged picture in each of the instruments from the same *cliché*, and compare the results. The pictures were so taken, and exhibited at the Society's rooms, and, in Mr. Harrison's opinion, the picture obtained in Woodward's camera was preferable to the other.

M. Bertsch remarked, that among the proofs presented to the Society he noticed one, a copy of an engraving, of which M. Verneuil stated the original *cliché* had been obtained by means of M. Bertsch's automatic camera. He felt it his duty to observe that his automatic camera was not constructed with a view of being employed to copy engravings, and that it is taking unnecessary trouble to employ it for such purpose. He added, that many years ago he described a very convenient apparatus for rectifying stereoscopic pictures, in avoiding cutting them, and reversing the left to the right, and the right to the left. The arrangement he adopted for this object is identical with that now described by M. Verneuil in his enlarging camera.

In connection with the proofs presented by M. Verneuil, the president, M. Regnault, took occasion to again call the attention of photographers to the bad habit they had fallen into generally of focussing upon distant parts in the subject to be copied, instead of fixing their attention upon the foreground ; the result is that there is great sharpness in distant objects, but false perspective ; and such pictures are inartistic.

M. L'Abbé Verguet has presented to our Society a very interesting series of proofs copied from ancient manuscripts. The following brief description will show how curious and valuable they are :—

A manuscript of the eleventh century (A.D. 1072), placed between two portions of other manuscripts of the same century, one dated 1145, the other A.D. 1196.

A copy of a page of the folio manuscript of the Bishop of Salisbury, *De Nugis Curialium*.

A microscopic copy of a manuscript of the Book of Salisbury.

A manuscript of the eleventh century, A.D. 1072.

A manuscript of the thirteenth century.

A manuscript of the ninth century, May 1, 897.

The last two are very valuable. The whole are well worthy the inspection of archæologists and amateurs who may happen to visit the Photographic Exhibition now open in Paris.

THE LANDSCAPE MEDAL AT THE CORNWALL POLYTECHNIC EXHIBITION.

Sir,—Will you oblige by inserting in next week's News the following, the subject of which is unparalleled :—

I see a silver medal has been awarded at Falmouth to Mr. W. H. Warner, of Ross, for the best landscape. Upon what ground he is entitled to that medal I am at a loss to know.

In the first place, the negatives were taken by myself, unaided, last summer, in some of the wildest parts of Scotland and Isle of Skye, etc., etc., and were merely sent to Mr. Warner to print a certain number of copies, as you are aware he prints for the trade.

I am at present at a loss to understand by what authority he even prints more than the number required by the owner of the negatives, putting aside the question of the right to exhibit another man's work, and so deprive him of his just reward.

I see that Mr. Robinson is justly awarded a medal for the best portrait. Now suppose Mr. Robinson had been too busy, and had sent those negatives to me to print; should I be justified in printing more than he required, and then exhibiting his work ?

Had I his negative of "Bringing Home the May" I dare say I could produce a print as good as any yet produced ; but what of that ? As well might Mr. Robinson's assistants for their mechanical assistance, claim the medals already awarded to that photographer for its pictorial qualities.

Surely the man who selects the point of view and produces the negative is the person entitled to the reward.

It may be easy work to produce negatives 15 × 12 at home, or with a dark van well stocked : let any man try the same size with a tent, in the wild mountain passes of Scotland. With everything jolted and carried upon the backs of ponies for seven or eight hours at a time, let him encounter the cutting winds and rain, and sleep on the mountain tops, merely because he finds the day too far gone by the time he reaches his destination, and he will then find I have not spoken without just cause.

I must apologize for troubling you, remaining—Yours faithfully, George Restall.

Birmingham.

[If, as we understand the award, it is for the "best landscape," and not for some method of printing, it is clear that a mistake of some kind been made, in which case we feel satisfied that Mr. Warner will at once assist in rectifying it. —Ed.]

THE LENS MEDAL AT THE NORTH LONDON EXHIBITION.

Sir,—In your issue of Sept. 1st you announce that I have been awarded by the jury of the North East London Exhibition a medal for the high general excellence of my lenses for photographic purposes.

I hope you will allow me space in your Journal to state that it is impossible for me to accept a medal under circumstances other than those which I could regard with feelings of pride and pleasure, and as some honourable recognition for years of toil and study in trying to perfect the most important toils of the photographer.

Allow me, Sir, to inform you that the jury have conferred upon me an honour which I do not feel entitled to receive from them, inasmuch as no examination of my instruments, as you are perfectly aware, ever took place, nor was any comparison made of the lenses of the different exhibitors. Under such circumstances it is obvious that I cannot conscientiously accept the honour the gentlemen of the jury have so courteously bestowed upon me.—I remain, yours truly, Thomas Ross.

[Mr. Ross would have done more wisely if he had awaited the issue of the Report of the jurors before coming to any conclusion as to their awards. The Report is an essential portion of their awards, inasmuch as it explains their decision on points which could not be expressed clearly by the mere announcement of the medals given. An opinion formed before seeing that Report is therefore formed on imperfect data, and less valuable than it would have been as the result of full information. Moreover, as no official intimation of the awards has been made, and no official Report published, Mr. Ross practically refuses that which has not been offered to him. Until such announcement has been made, the jurors would be quite at liberty to modify their decisions, and thus it might have happened that the medal Mr. Ross refuses might never have been offered at all. We publish the Report in the present number; it will be found to contain, we think, a satisfactory answer to any comments on the awards, although it was prepared before such comments had been made.—Ed.]

NEW RAPID INTENSIFIER.

Sir,—I have now used for many months, and consequently tested thoroughly, an intensifier for iron-developed negatives that is, I believe, far better than any other of which the formula has been published; it is simple, clean, rapid, yet perfectly under control, and, by its *judicious* application, a great number of well-developed negatives may be intensified in a marvellously short space of time. A good negative, completed with this intensifier is vigorous without being hard, is unchangeable, and gives fine prints, in which the half-tones and delicate shades are admirably preserved.

I have communicated it to two or three photographers, and amongst these a member of a photographic firm in the North, who tells me that they prefer my intensifier to any other, as by it they obtain the best negatives, and they now never use any other in their extensive practice.

I claim to have originated this intensifier, for though I am fully aware that its constituents have been and are used for this purpose, I have never read or heard of their being employed in combination and in the manner I shall describe. There will doubtless be various opinions as to its merits, and I shall be very glad if you will yourself test its efficiency before introducing it to your readers. I have from time to time obtained many valuable hints from the Photographic News, and I am therefore happy to communicate anything that may be useful to some of your readers.

The formula is as follows:—

Stock bottle No. 1.

Hydrochlorate of ammonia	1 ounce
Bichloride of mercury	1 „
Distilled water	20 ounces

Stock bottle No. 2.

Chloride of gold	1 grain
Distilled water	1 drachm

To make the intensifier, put two drachms of each solution into a four-ounce bottle and fill up with distilled water.

A small quantity of this should be poured rapidly over the negative, from a glass measure, and kept moving upon the surface in the usual way until the necessary density be obtained. If it has lost its yellow colour and become white when returned into the glass, it should be thrown away, and the operation, if incomplete, must be continued with fresh solution.

I may add that there is yet another and not unimportant merit in this intensifier. A small quantity applied to the film of a well exposed and fully developed negative will enable you to view the portrait *through* the glass, and then it has the appearance of a very delicate and beautifully shaded positive; thus permitting the sitter to judge at once of the likeness, expression, &c.

In the case of a *very* thin negative, the intensifier may be followed by a *weak* solution of iodide potassium—½ a grain to an ounce of water.—I am, sir, your obedient servant,

C. T. Winter.

Newliston House, Barnstaple, September 2, 1865.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

Sir,—Your correspondent who notices the pictures exhibited at the Falmouth Polytechnic Hall seems to think that I am indebted to the art of the taxidermist for the sharpness of my photographs of dogs and cats. I beg to say that they were done to order in the usual way of business, and "gathered straight from nature," a good lens and chemicals, with a small modicum of patience only being necessary to produce the pictures of which your correspondent writes. I may add, that they were all taken in a glass house, with exposure varying from two to twelve seconds.—I am, dear sir, yours very truly,

Cheltenham, Sept. 13, 1865. A. W. Hosmer.

[That our correspondent, referring to these pictures, should fancy from their sharpness that they were produced from stuffed animals, is really a high compliment. From the mis-spelling of the name, we did not recognise the producer of these pictures. We are glad to perceive that they are the work of one we know to be an excellent photographer. —Ed.]

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Talk in the Studio.

Mercury and Gold Intensifier.—Our correspondent, Mr. C. T. Winter, sends us some examples of the prints obtained from negatives intensified in the manner described in his letter in another column. There is a delicacy of gradation and a perfection of fleshy texture, combined with brilliancy rarely attained, which speak very highly for the process.

Collodio-Bromide of Silver.—Mr. Sayce has favoured us with some further excellent specimens from negatives obtained by his method. Here is one as soft as we ever saw a print from a wet plate. The subject is "Waiting for the Boat," with figures, a scene in the English lakes, with Scawfell Pike in the distance, taken with an exposure of twenty-five seconds, with a Ross stereo lens of 4½ inches focus and smallest stop, which is less than 3-16ths of an inch.

Mr. Moens' Captivity.—It appears that Mr. Moens suffered great privations during his captivity, details of which are yet to be stated. The Italian papers, it is said, are full of apocryphal accounts of the matter.

Cases for Opal Pictures.—Mr. Mander showed us, during a visit to the British Association at Birmingham, some exceedingly excellent cases he is manufacturing for the collodio-chloride pictures on opal glass, by which they can either be examined by reflected light, or as transparencies by transmitted light. The cell into which the picture, with its matt and glass, fit, is attached only at the back like the leaves of a book, permitting the picture to be held up to the light for examination. The fitting, finish, and general getting up of the cases, which are known as "Cupids," are all good and exceedingly pretty. For opal pictures they ought to become universally popular.

The Origin of Photography.—The Rev. J. B. Reade, in a recent conversation, called our attention to the fact that Baron Liebig, in stating that Mr. Talbot arrived at the use of gallic acid by induction, makes an error. Mr. Reade, who was the first to use gallic acid, had really informed Mr. Talbot of its properties in accelerating and giving intensity to the photographic image. Mr. Reade had produced photographs with the aid of gallate of silver years before Mr. Talbot. It was, moreover, when taking an impression direct from the *Trientalis Europœa*, and not when using the solar microscope, that Mr. Reade, being called away, afterwards found a perfect impression on paper which had been thrown away, containing no image. Mr. Reade remarks that, singularly enough, even then the notion of the existence of a latent image did not enter into his mind. The recognition of the idea of a latent image capable of development Mr. Reade considers due to Mr. Talbot. It must not be forgotten, however, that the existence of a latent image and a process of development had first been discovered by Daguerre. We note these corrections by Mr. Reade with pleasure in the interest of historic truth. In a few years there will be no living witnesses to give their testimony on these points.

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To Correspondents.

Kent.—If distilled water be not readily accessible, hard water, which has been boiled for a time to precipitate the carbonate of lime, may be used for photographic purposes. Rain-water may also be used, especially for the developer, but we should prefer trusting to the boiled hard water in making a nitrate bath, as rain water is frequently contaminated with organic matter. 2. In making a solution of wax in ether, to apply to a glass plate for aiding transfer of the film, it is not important to use any especial proportions. Place in a wide-mouthed bottle the wax, broken into small pieces, and sufficient ether to make it into a soft paste.

J. Arbright.—The snowy effect of stereoscopic pictures is chiefly due to the use of an over-intensified negative. Sometimes a similar effect is due to a paper rough surface, every little point on the surface of which reflects light; and this effect, being magnified in the stereoscope, gives a snowy effect.

H. X.—Some samples of gelatine give, with the proportions we published, a solution a little too thick, in which case less gelatine may be used, or the solution may be diluted, as you have mentioned, with ordinary developer. Examples of gelatine vary very much in quality. Heat may be used in assisting solution, when time is an object. The completed solution may be filtered, if necessary; but not otherwise. 2. Drying the collodio-chloride film on opal glass by means of heat is desirable, but not imperatively necessary when not convenient, provided proper precautions be used to secure perfect dessication of the film before placing it in contact with the negative. 3. The varnish known as "crystal varnish" is used without heat, and is suitable for positives on glass. 4. It seems probable, from your further explanation, that your collodion must be in fault. 5. We know of many cases in which treatment of the bath with cyanide has been most successful. A neglect occurred in posting the packet. You have doubtless received it by this time.

W. O. C.—Relatively, quick. 2. Yes, perfectly. 3. We do not like the result produced by cyanide of potassium in reducing over-printed proofs; but if it be used, it is better done after fixing, as you cannot tell, until after ordinary fixation, what will be the exact depth of the print.

Kyle.—The question of pin-holes is a very troublesome one, as they may arise from so many sources. The most obvious and easily remedied causes are dust in the slide or in the nitrate bath; but the most probable cause is excess of iodide of silver in the nitrate bath, and as iodide of silver is less soluble in hot solutions than in cold solutions, the bath is apt from this cause to be turbid in hot weather, and pin-holes ensue. The remedy is to dilute the bath with twice its bulk, filter, and then add sufficient nitrate of silver to make up the bath again to the proper strength. In intensifying, be content to intensify slowly, and add very little nitrate of silver to the intensifying solution, as rapidly reducing silver on the image frequently produces pin-holes.

J. R.—S. Zachari, of 4, Bath Street, Bristol, will be happy to communicate with J. R., in reference to the reproductions by Sala and Co., of Berlin.

Henry Morton.—Your landscapes are good, and might with propriety be sent to an exhibition. The faint copy is, of course, imperfect, and we cannot properly judge of the general effect from a bad print.

Alfred.—We have not tried ammonia-sulphate of iron with gelatine, and cannot give an opinion of its probable value. It is a matter for experiment. If you try the experiment, you may with advantage employ about one-third more of the ammonia-sulphate than of the simple sulphate. 2. In making a new bath, we always try a picture first of all, and then proceed, if necessary, to neutralize or sun, or otherwise deal with it as may be suggested by the indications given. 3. Negatives developed with the gelatino-iron solution may, if necessary, be intensified with pyro and silver in the usual way.

A Constant Subscriber.—By placing your prints in a perforated box, and immersing it in the running stream you describe, you could, of course, give a certain amount of washing to your prints. But it is very difficult to eliminate all the hyposulphite from prints by the mere action of running water. It is necessary, too, that the prints should be alternately dried and washed to get the best result. 2. The sky becoming too dense, and the distance being almost obliterated before the foreground is sufficiently developed, in tannin plates, indicate under-exposure and the use of the tannin solution too strong. In preparing the plates, use the tannin solution weaker, and give a little longer exposure, so that the detail may be brought out without prolonged development. The addition of too much nitrate of silver to the developer will also promote the defects you name.

R. A. E.—We believe that the use of a gas-stove without a chimney may frequently prove injurious in an operating-room. If the chimney be added, we see no objection to its use.

William Hardman.—An unvarnished negative is better for enlargements than a varnished one, simply because the structure of the varnish often shows in the amplified print, giving a coarse effect. 2. In using the solar camera, the focus is obtained on a plain sheet of white paper, which is removed when the image is seen to be quite sharp, and a sensitive sheet put in its place. It is very easy, after a little practice, to ascertain when the sharpest possible focus is obtained. 3. The further the screen is removed from the camera, the larger the image, of course.

G. Randall.—The washing water of unfixed prints should not be mixed with the toning-bath, as each requires different treatment to precipitate the precious metals. The silver from the washing water should be precipitated with common salt, and the gold from the toning-bath with protosulphate of iron. See article on the subject in our Year-Book for 1864. 2. The existence of spots in albumenized paper is a difficulty that cannot be entirely got rid of. It is chiefly due to defects in the original paper, over which the albumenizer has no control. Some examples are worse than others. 3. The addition of alcohol, say about one part to six parts of water to the nitrate bath, tends to prevent its discolouring.

C. Taylor.—The white of one egg in six ounces of water, the whole well beaten together, and then filtered, will answer the purpose. First wet the collodion film, and when it is well drained, but not dry, apply the albumen solution.

Smale.—The curious markings in your card prints, all nearly alike in shape, and in the same position on the card, suggest to us the probability that the cloth lining of the back of some one of your pressure frames has become contaminated with something which marks every print which comes in contact with it, in nearly the same way. That is the most probable suggestion of a cause which would produce such a defect.

Alexandra.—Photography as a business is so young, that in the matter of apprenticeships it has not acquired yet any regular or recognized rules or traditions. Each person in such case must make his own arrangement. In regard to a youth of sixteen, if he be apprenticed, we should say that it should be for not less than four years. The premium and rate of remuneration will necessarily depend on a variety of circumstances.

Starch.—We do not think that salted arrowroot paper is usually kept. Mr. Hughes, of Oxford Street, used to keep some of Liesegang's arrowroot paper, but we are uncertain whether he continues to do so. Mr. Sandford prepares arrowroot paper for the collodion processes, but it is not salted.

W. W.—For enlarging from card size to 15 by 10, we think the plan of enlarging the negative preferable. The details would occupy too much space, but you will find many articles in our back volumes. Our last Year-Book contains a description of a suitable camera by Mr. Burgess, and some valuable hints on the method to be adopted by Mr. Blanchard.

Vogel's Triplet Lenses.—Two correspondents have kindly favoured us with information, referring to our answer to "Light and Shade" a fortnight ago, to the effect that they have tried Vogel's Triplets, and find them satisfactory. As a rule, we avoid allusion, as much as possible, to the essentially commercial aspects of photography; but here it appears to us that some remark is necessary. From the remark of one correspondent, we infer that these lenses are imitations of those of the best English makers, and intended to compete with them at a lower price. This is a thing against which we must always protest. After a first-class maker has, at much expense of time, capital, and intelligence, worked out the details of form and construction of a good instrument, it is not difficult for a less capable person to make a tolerable imitation, which may in some instances work pretty well. Besides the injustice to the original manufacturer, however, it is tolerably clear that imitations are very uncertain in their character, and where one instrument may turn out well, others may turn out worthless. We cannot certainly, however, say that these observations apply in the present instance, for whilst one correspondent leads us to suppose that they are similar to the triplets of a London maker, another correspondent intimates that they are portrait-lenses, and sends us examples of their work, very excellent so far as they go, but scarcely any test of the general qualities of a lens, since they are large vignetted heads, card size. The lenses with which these heads are taken are stated to have a focus of 5½ inches, the price being from £4 10s. to £5. This is a higher price than that of the triplets of the best English makers.

Lux et Salus is thanked. The pictures are fine, but the price foolishly low.

Onward, Historicus, and other Correspondents in our next.

Report of the Amateur Photographic Association and several other articles are compelled to stand over until next week.

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Photographs Registered during the Past Week.

Mr. Lambert Weston, Dover,
Photograph of Charles Freshfield, Esq., M.P. for Dover.
Mr. J. S. Brown, Bridgewater,
Photograph of Sir John Shelley, Bart.
Mr. Monson, Bridge Street, Southampton,
Photograph of Duke of Grafton, Earl Spencer, and Officers of Northamptonshire Volunteers.
Photograph of Tea-Party at Camp—Countess Spencer making tea.
Photograph of Group at Spencer Tent—Countess Spencer making tea.

THE PHOTOGRAPHIC NEWS.

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PATENT LAW AND INVENTORS.

The question of patent right has always been one beset with many difficulties, and there has been a growing tendency of late years amongst a certain class of thinkers to get rid of these difficulties by abolishing patent monopolies altogether. At the late meeting of the British Association Professor Rogers read a lengthy paper on the subject, in which he intimated a conviction that the State would be benefited by the abolition of both patent right and copyright. The *Times*, enforcing his views, insists that patents "ruin inventors; they clog manufacturing industry, they impose a tax upon the community, and they benefit only patent-agents and lawyers;" adding, "the more the subject is considered, the clearer will be the opinion in favour of their abolition."

In regard to an art like photography, the progress of which has depended so much, and probably will continue largely dependent, on invention and discovery, the question of patent right cannot fail to be interesting; and from two causes there prevails amongst photographers generally a dislike to patent restrictions. The first cause is a prevailing belief that the early progress of the art was clogged by patent monopoly; and the second cause is a long familiarity, during late years, with free publication and unfettered use of discoveries. Nevertheless, we venture to think that, notwithstanding the impolicy and illiberality of patenting small inventions in any art, the progress of invention would be seriously checked if the protection of the patent-law were removed, and that photography may readily furnish illustrations of the loss to society which might arise if patents were abolished.

The two primary objections to patent-right are based on the question of abstract right and practical inconvenience. It is alleged that no man has an abstract right to property in an idea, except to maintain it for his own use; that if a man make a discovery or invention, he has a right to maintain his secret and apply it to his own use; but he has no right to prevent another man from making the same discovery, and using it profitably. In short, that priority of discovery gives him no claim to monopoly. The whole of the question of abstract right is involved in this statement of the position. Then comes the practical argument. It is alleged that patent rights clog progress; that a monopoly in the use of a given invention or discovery warns off all other inventors not simply from the discovery which is protected, but from other discoveries, inventions, or improvements in which that already patented is involved. As Professor Rogers states the case, "there is so vast a collection of protected rights, a collection amounting to many thousands, the progress of invention is seriously hampered, that the road through practical science is as hard as that of Bunyan's pilgrim through the valley of the shadow of death, with a ditch on one side, and a gorge on the other full of snares, traps, gins, and nets on the one hand, and of pits, pitfalls, deep holes, and slidings down on the other, to say nothing of the satyrs, hobgoblins, and dragons, by which the region is infested."

The question of abstract right may be very easily dismissed, we think. No one who has thought much on the subject will maintain the right of any one to a monopoly in ideas simply because of priority in discovery. It is true that priority of occupation is the primary basis of all material property. The first discoverer of anything without an owner acquires the natural claim to its possession. But in material property a second claimant cannot occupy without dispossessing and injuring the first, whilst in relation to ideas a hundred may share without any one being impoverished. A discoverer or inventor may use what he has discovered or invented without being injured by a second person making use of the same or a similar discovery or invention. Moreover, a dozen persons may independently make this same discovery, and each without trenching on the property of the other. It would be idle, then, to assert that the first discoverer has acquired an abstract right to a monopoly in the use of his discovery, and that all other subsequent discoverers should be debarred from working in the same direction. But abstract right is not necessarily the guide to public policy. In establishing patent-right the State makes a bargain with inventors and discoverers. Knowing the natural tendency to create monopoly by means of secrecy, and knowing the barrier to scientific and industrial progress which secrecy involves, the State says to the inventors, We will grant a certain period of monopoly to the first registrar of an invention or discovery; the conditions upon which such monopoly is granted being the unreserved publication of the discovery in all its details, for the purpose of spreading information at once, and of enabling the public to gain the advantage of this discovery when the period of its protection shall have elapsed. The institution of this bargain between inventors and the State has thus the double advantage of spreading information and stimulating invention, and by both operations promoting scientific and industrial progress.

That the arrangement by which this monopoly is granted sometimes does injustice, it may be admitted; that as the laws exist at present, a great many anomalies are constantly perpetrated, there cannot be a doubt; but this, we submit, is simply a reason for amending the laws and revising the machinery, and not for abolishing the stimulus which such a protection affords to inventors, and such a check to the maintenance of trade secrets.

Let us try the case in its possible bearing on photography, an art in which, by the way, very few patents have hitherto remunerated the patentee, but in which many improvements have been worked out with a view to the possession of a patent monopoly, which would possibly have remained unworked out if no such monopoly had been possible. Let us suppose, for argument's sake, that some experimental chemist should discover a cheap substitute for the salts of silver in all our photographic operations, by which some thousands of pounds annually could be saved to the photographic community. But the first discovery is a crude idea which may require months of patient experiment to develop into a practical and useful shape. If he publish that crude idea with its rough imperfect results, it may not possess sufficient value to any individual to render it worth while working it out; that is, it will not save sufficient to any one photographer to render it worth his while to spend a good deal of money and time on a result problematical, it may be, at best, and certainly not remunerative to him. In short, whilst it might effect a large aggregate saving when perfected, and a minor saving to everyone to whom it was presented in a perfected form, it could only be remunerative to anyone working it out on the condition of possessing for a time a monopoly in its preparation. Priority in the field might happen to be of no value to the discoverer if he were not a capitalist; but if he could be sure of his discovery being protected to his own use for a time, it might pay the discoverer to spend time and money to work out patiently, his great idea. If it succeed, the whole photographic community will receive the benefit as well as he; but without a patent law it is probable that the idea will remain in its crude form, few seeing its possibilities even when published, and none caring to put them seriously to the test.

To take actual cases. Mr. Swan's carbon process, although based on known ideas, required months of careful experiment to bring it into the shape in which it appeared before the public; it will require, probably, more time, thought, and experiment, before it can become the practical process which we hope in time to see it; and without a probable profit in the result, such processes rarely reach the perfection which patient labour and skill can alone secure for them. Here is Mr. Woodbury's photo-relievo process, which very forcibly illustrates the fact that it is with the first registrar of a discovery that the State makes a bargain, involving publicity on the one side, and monopoly on the other. This process is based on a distinctly new idea in mechanical printing, namely, the use of gradations of thickness in a translucent ink, to secure gradation of tones in a picture. Mr. Swan was an independent discoverer of this idea; so far as we know, a prior discoverer. He knew the value of the idea, but felt that to publish it as a crude idea, without illustration, would secure him neither profit nor pleasure. Pressed with other avocations, and undetermined as to the application of the idea, Mr. Swan preserved the secret, merely explaining it in confidence to one or two persons. Mr. Swan here exercised his abstract right to preserve his secret, and, so far, the community derived nothing from its existence. In the meantime Mr. Woodbury made an independent discovery of the same idea, and patented it at once. Having leisure, capital, and enterprize, he at once set to work to bring the process into a practical shape. Many experiments were to be made to secure successful working, inasmuch as the principle was quite new, and success depended on new conditions. Various plans had to be tried for securing the most suitable gelatine reliefs and the best metal intaglios from these reliefs, the best presses for printing, and the best surfaces for working on. This has already occupied many months of close experiment and no little expenditure of cash—certainly an expenditure of time and money which no man would have been likely to undertake, if, when everything was perfected, some one could have stepped in to reap the fruits of this time, money, and enterprize, without any trouble whatever. Protection, in the shape of a limited period of monopoly, is one of the chief incentives to exertion in such matters. Even if, as is too often the case, that monopoly is valueless when obtained, it operates as an incentive to exertion by which progress is stimulated which otherwise would never have been secured.

Whilst, then, we deprecate the patenting of any minor improvement in an art like photography, the history of which has so many instances of liberality, we equally deprecate those arguments which appear to be gaining ground in some directions, which assert that patent protections are a wrong to the community and a barrier to the advancement of industrial art and science.

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NORTH LONDON PHOTOGRAPHIC EXHIBITION.

Portraits and Studies.

The chief absentees of importance from the North-London Photographic Exhibition are a few of the ablest portraitists, such as T. R. Williams, Mayall, Claudet, and a few others. Nevertheless there are some exceedingly fine portraits exhibited. Of those which received the honour of a medal, exhibited by Mr. Foxlee, we prefer the whole plate vignette heads, which are as excellent in every respect as they can well be. One of Mr. Hislop is especially admirable, both as a likeness and as a photograph. The portraits exhibited by Mr. Jeffreys are very fine, and make the visitors acquainted with some notable men. The head of Tennyson is exceedingly good, and presents us with a head more strikingly intellectual and grand than does Browning, whose portrait hangs close by. Some reproductions and statuary by Mr. Jeffreys please us still better than his portraiture.

Mr. Rejlander contributes some of the best pictures we have seen from his studio. His portraits and portrait studies are alike excellent, and display more artistic power, and more original thought, than any others of the same class in the exhibition. Especially noteworthy for freshness of feeling, and the higher forms of technical excellence, we may select half a dozen from the many fine pictures he exhibits. Here is one entitled "Maternal Solicitude," a beautiful face with a thoughtful, sad expression, delicate, round, and exquisitely modelled, with a wonderful tenderness and transparency in the cast shadows, and a limpidness and beauty in the fine eyes, rarely seen. Another, entitled "Lightheart," is a charming piece of nature, in which a sweet faced girl, in a flap-brimmed hat, is admirably posed and caught with an expression which belongs so naturally to the position and general arrangement, that it seems impossible that any part could have been altered without spoiling the whole. A companion picture, entitled "Heavyheart," but which expresses sudden terror or horror more adequately than sadness, is a picture wonderful for its rendering of the eye when dilated, and almost starting from its socket, in feelings of strong excitement and horror. We may remark, in passing, that in many instances Mr. Rejlander is a little strained and unnatural in selecting titles to good pictures, a fault, if it be a fault, trivial in itself, but likely to bring him under the critical lash of the gentleman who does the photographic summary in the *Popular Science Review*, who was so angry with Mr. Robinson for giving to his portrait of a young lady the name "Brenda," which she received from her godfathers and godmothers in baptism. Another of Mr. Rejlander's most striking studies is well entitled "The Somnambulist." The rapt unconsciousness of the face, the singular effect of lighting from beneath, like that produced by holding a candle in the hand, and the general keeping of the picture, are all admirable, and as strikingly natural as they are fresh and effective. The "Bishop of Llandaff" and the "Earl of Warwick" are two admirable portraits by Mr. Rejlander; several other fine portraits and studies, some frames with studies of hands, a frame containing some exceedingly fine card portraits, and a frame entitled "Cat's caught by Rejlander," complete Mr. Rejlander's contributions to this exhibition. The frame of cats is a most interesting study, containing almost every phase of position and expression. There are few men belonging to the photographic fraternity who have displayed as much thought in their work as Rejlander; few who have displayed so much fertility of ideas, and such skill in embodying those ideas; few who have shown such mastery over what may be termed the higher forms of technical excellence, such as the management of light and shade, position, arrangement, &c.; few men have met with higher appreciation amongst their brethren for the high qualities we have named; and yet it has strangely happened that Mr. Rejlander has not attained the high degree of success which, from such an enumeration of undoubted excellencies, might have seemed inevitable. There appear to be two reasons for this: one is hinted at in the report of the jurors published in our last—a certain want in the lower forms of technical excellence, a slight slovenliness in the cutting and mounting, at times a slight want of cleanliness in developing. These are small matters to weigh against so many rare pictorial excellencies; but unfortunately they are defects which mar the effect of pictorial beauties, and destroy, at times, their power to give pleasure. Another, and more potent cause, has been a certain tendency to a fragmentary character in his work. The very end for which he has worked, has, in too many instances, tended to produce this fragmentary character: he has produced *studies*. Studies, of course, are only aids to something else. Those who have visited the Victoria Cross Gallery at the Crystal Palace, containing pictures of a series of scenes in the war of the Crimea and Indian Mutiny, may remember a series of portrait studies hastily and roughly sketched. These were very interesting, but of small value, except in relation to the great works to the production of which they were aids. Mr. Rejlander has, from a pure love of art, we believe, devoted much of his life to the production of artistic studies, merely aiming, in many instances, at the illustration of some idea, or at times merely of some single phase of an idea. He has produced much that is beautiful and interesting; but we fear but little appreciated by that portion of the artistic community for whom it was primarily intended. Amongst painters, the men of honour and ability, as Mr. Rejlander recently remarked to us, will not copy or borrow ideas from photographic suggestions; and the men who will copy and borrow will not only not acknowledge, but will too often abuse the source from whence the aid is drawn. We are glad to believe that Mr. Rejlander is devoting himself now more entirely to portraiture, in which his real power, and freedom from conventional treatment will, we hope, place him in the highest and most successful position. He has, moreover, in former years, produced some fine and complete pictures by photography; why should he not produce more?

Mr. Gillard contributes some examples of a new form of portraiture entitled "Duplex Medallions," consisting of two profiles—that of a lady and gentleman—one profile being slightly in advance of the other, as two faces are sometimes rendered in *bas reliefs* and medallions. Whether this is secured by a process of double printing or by some other means we have not had opportunity of examining or ascertaining; but the effect is pretty and well managed. Mr. F. Downer exhibits some very charming card portraits and groups. One, a lady standing by a child on a donkey, is most admirable in composition; the quiet sky and distant landscape, the bold foreground and harmony of the whole, are most satisfactory. As we have before said, the picture is from two negatives. A croquet party and some of Mr. Downer's portraits are exceedingly charming.

Mr. H. Cooper has several frames of portraits and studies of the highest excellence. Nothing can exceed the technical perfection of the majority of Mr. Cooper's pictures, which are clean and delicate, soft, well-modelled, round, and brilliant. In the rendering of expression and action he has, in many instances, been highly successful; we may especially instance, "The Yawn," "The Sneeze," "The Laugh," and some others, as illustrations. Mr. Blanchard exhibits some very fine portrait studies, which we have before had occasion to notice: of these "The Zealot" pleases us best, both in photographic and pictorial qualities; there is in it a force and massiveness in the whole picture rarely attained in photography. His group of children playing in the studio is also an excellent composition, fine in conception and execution. Mr. Leake has some fine large vignette heads, which are delicate and soft without lack of force. Mr. G. Hooper, of Clarkington's Sponsolia, has some very fine card portraits, rich, delicate, round, and forcible. Mr. Twyman, of Ramsgate, exhibits his musical party, entitled "Our Society," of which we have before spoken in high terms. His fine portraits of Sir Moses Montefiore and a number of clever vignetted portraits are well worthy of attention. Messrs. Southwell Brothers have some exceedingly fine large portraits, and a frame of card portraits, the excellence of which loses considerably in effect from the *bizarre* mounting. Mr. Lonsdale exhibits some good and effective portraits of Miss Marriott in different characters. Sergeant-Major White sends his frames of fine portraits, which we noticed in Conduit Street Exhibition. Messrs. Maull and Co. have some exceedingly fine portraits. Mr. Hosmer sends some capital card pictures very effective portraits of animals. Dr. Hemphill's portraits and studies, of which we have before spoken highly, are exhibited here. Mr. Aldis has a frame of portraits of himself, exhibiting a great variety of phases of action and expression. Mr. Debenham, Messrs. Le Beau and Rust, Mr. Hutton, Mr. E. Edwards, Mr. Bockett, and some others also exhibit good specimens of portraiture.

Mr. H. P. Robinson exhibits, marked "not for competition," some of his famous compositions. The place of honour in the room is occupied by the most magnificent print of the most magnificent picture which has yet been produced by photography, we mean the "Bringing Home the May." We were struck by the oral criticism on this picture of the oldest representative of the daily press in examining the pictures on the day of the private view. "The sun," he exclaimed, "is, after all, your true Pre-Raphaelite. Why, this picture absolutely lives!" The "Autumn," not represented by a first-rate print, is here also; we invite the attention to it of all interested in verifying a *soi-distant* "Artist's" idea of a picture made up of artificial scraps. The "Lady of Shalott," as sad and mystic in the picture as in the Laureate's strange poem, is here, and one of the grandest examples of portraiture we have yet seen produced by the camera, in the shape of the likeness of Mr. Robinson himself, seated at ease in his study.

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REMARKS ON GOLD TONING BATHS.

BY M. CAREY LEA.

Photography is an art in which everything depends upon little niceties of manipulation. And this is so much the case that it very often happens that one experimenter will succeed well with a process, simply because he has, by long experience, learned exactly how to use it, whilst, for want of a similar knowledge, he will perhaps fail with another which may be even better than that which he has become so thoroughly versed in.

Where so much depends upon the nature of the manipulations, there will necessarily be a wide divergence of opinion, and this exists in nothing, perhaps, to so great an extent as in the gold toning bath. One operator succeeds and obtains beautiful results with a bath which to another gives nothing but blue mealy pictures. What suits him, a third cannot work with, perhaps, at all, but complains that it bleaches his pictures off the paper.

In an editorial some time since published in the *British Journal*, the opinion was expressed that the one essential point in a gold bath was to render the gold solution neutral, and that, provided this was properly effected, it did not matter much how it was done.

I think this opinion can scarcely be sustained. Gold in a state of fine division is capable of exhibiting all the colours of the rainbow, and in the most brilliant hues. This fact is well exhibited by washing a dry gelatine film with ethereal solution of chloride of gold, and then precipitating with protosulphate of iron. The gelatine holds the action of the reducing agent in check; the deposit of gold is slow and irregular, and assumes the most exquisitely brilliant hues, varied like the spots in a peacock's tail. Everything seems to depend upon the state of division which exists in the particles. And the substances which are placed together with the gold in the toning bath control the state of division of the gold to a remarkable degree. We all know that alkaline chloride gives one tone, lime toning another; that the presence of certain organic acids, acetic, citric, benzoic, tend to give warm red, purple shades, and so on.

I had lately a striking and rather unpleasant instance of the manner in which the tone may be modified in extraneous substances.

A bath was used consisting of pure neutral chloride of gold and calcium. The gold was very pure chloride, which I had made myself, and the neutral salt was prepared from it by agitating it with precipitated chalk, and filtering. This bath gave, as usual, a rich purple-black tone. But on the occasion here referred to, every print thrown into it assumed, not a purple black, but a brownish purple colour, varying in different prints; those from the strongest negatives had most of the purple, those from thinner negatives were completely brown.

The production of a brown tone by a neutral gold bath seemed very strange, and was finally explained in the following manner. An experiment had been made in toning a print which had already been subjected to the influence of hyposulphite of soda, and there was reason to believe that it had not been thoroughly washed thereafter, and before placing it in the toning bath. The presence, therefore, of an exceedingly small amount of hyposulphite had been sufficient to completely alter the toning properties of the gold bath —more so, probably, than if a large quantity had been added. We know that gold with a large excess of hyposulphite of soda tones very well, at least under favourable conditions. The fact that a small quantity of hyposulphite acts very differently from a large one is sufficiently exemplified also by this fact. If a print be taken, immediately after its exposure in the printing frame, and thrown into a strong solution of hyposulphite, it is simply fixed thereby; but if it be thrown into a *very* dilute solution and the silver is in excess, a dead black coat of sulphide of silver forms all over it, and the print is of course destroyed.

It seems to me probable that the fact which I have just mentioned—viz., that the introduction of a trace of hyposulphite leads to the production of a brown tone—may explain the occasional production of ugly brown tones by careless operators. In these cases the mode of introduction of the hyposulphite is probably through the fingers, which, in fixing one set of prints, become moistened with the soda salt and carry it into the toning bath.[*]

Photographers are now resting in the hope that by careful gold toning, followed by fresh hyposulphite and thorough washing, they are making permanent prints. I wish it were so; but the examination of a few photographic albums, which always comprise specimens from a great variety of sources, is quite enough to dispel the idea. It is surprising in how considerable a proportion the indications of change are found to be making themselves perceptible. There is, first, that faint cream-coloured tinge in the white, an alteration which may not at the outset affect the appearance of the picture in the least injuriously—that is, to the ordinary observer; but the photographer recognises it as the first indication of a profound internal change that is going on in the print, and which is to be followed by a loss of depth in the shadows, a diminution in the brilliancy of the effect, and finally, a conversion of the entire print to a miserable buff-brown image on a dirty yellowish ground.

It has long appeared to me to be probable, that as this change first manifests itself in the high lights, the albumen is responsible for it, and have, I suppose, examined the high lights of near a hundred prints on albumenized paper, printed and toned in the most various ways. The quantity of silver in the *perfectly white* portions varied considerably, but it was *invariably* present.

I was, therefore, glad of an opportunity which recently occurred, of applying the same test to a Wothlytype, and found, with great interest, that the assertion of the complete absence of silver from the white, was borne out by the facts. It is probable that, in all other respects, prints on chloride of silver are as durable as the Wothlytypes; but in the point just mentioned, the Wothlytypes exhibit an unquestionable superiority. The simple fact that nitrate of silver coagulates albumen, is a clear proof that a chemical combination is brought about. And it is very remarkable that the hyposulphite of soda, which is able to decompose compounds so firmly united as those of silver with chlorine, iodine and bromine—compounds in which the constituent parts seem united by a peculiar and special affinity—should yet be unable to remove this small proportion of silver from what would be at first sight supposed to be a comparatively unstable combination. Unfortunately, however, this inabilty is as true as remarkable, and whoever will give us a fixer which shall be capable of unlocking this vexatious compound, or will find a really efficient succedaneum for albumen, will render a vast service to photography.

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THE ACTION OF LIGHT ON IODIDE OF SILVER.

(A REPLY).

BY DR. H. VOGEL.

It is an old experience, that when a new truth has been brought to light, or a new discovery, there are those who come forward and consider that they themselves already discovered this same fact years before. In this respect it by no means surprises me that, after my experiments on the action of light upon iodide of silver have become known to the photographic public, this same experience should be mine.

At a sitting of the Paris Photographic Society, M. Poitevin has endeavoured to show that he had brought to notice some two years ago the results obtained by me, and cites as proof a few sentences from a former treatise of his, which I only have known in an imperfect German translation.

The first brings forward a sentence from his "*Traité de l'Impression Photographique sans Sels d'Argent,*" in which he says, that for the reduction of a substance through the influence of light the presence of a body is necessary which absorbs the disengaged elements, and which thus forms a combination more stable in light.

This sentence is, after my investigation, only applicable in certain chemical combinations, but by no means in all, since many substances (*e. g.*, chloride of silver, oxide of silver, &c., even when in a chemically pure condition) are reduced by light. In my investigation I have drawn especial attention to this fact.

M. Poitevin then cites a passage from his very praiseworthy publication in *Bulletin de la Société de Photographie de* 1863, where he says, "that the action of light is *nil* upon chemically pure iodide of silver *isolated* from every substance which can retain the iodine it tends to separate," and compares this with my sentence, "in the bodies which readily absorb the iodine and chemically combine with it, act as sensitizers upon iodide of silver, that is, they determine its reduction in the light."

To the importance of this fact for theoretical and practical photography several prominent photographers (*e.g.*, Wharton Simpson, Carey Lea, Monckhoven) have borne witness.

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[*] Receiving during the course of every year many hundreds of imperfectly toned prints, with enquiries as to the cause and a description of the attendant circumstances, we can give emphatic confirmation to the suggestion of our excellent collaborateur. A common and easily-recognised effect is generally produced on the toning bath at the same time: a slight discolouration is seen, and a brown precipitate is thrown down resulting from the action of the trace of hyposulphite of soda on the silver salts which have found their way, in the process of toning, into the gold bath. It is only necessary to place a finger slightly soiled with hyposulphite of soda into the toning bath to verify this suggestion.—Ed.

If now, as appearance would indicate, Poitevin brought this fact to light two years ago, how is it, I ask, that no one devoted to it the requisite attention, while my discovery attracts the attention of the most prominent photographers of the world? M. Poitevin's paper attracted, indeed, much attention in all quarters, but only in reference to the discovery, in itself highly interesting, that tannin and like bodies act as sensitizers; his new dry process was also much spoken of; but the sentence in question was practically ignored.

One may easily discover the reason of this if he reads the article in the *Bulletin* correctly. Shortly after the above-mentioned sentence, the following passage occurs:—"*Le-qui-porte à croire* que l'iodure d'argent sensibilisé est particulièrement ramené à l'état métallique aut tout moins," &c., &c. ("Which leads one to believe that the sensitized iodide of silver is particularly reduced," &c.)

From this it may be seen clearly enough that M. Poitevin did not consider the sentence above-mentioned as expressing an established fact, but only as an *uncertain supposition*.

Hence the want of clearness in the method of expression, and hence also he himself laid no emphasis upon this sentence, while, if he had been certain of the matter, its importance could not have remained concealed from him.

But still more evident may this be seen from the whole tenor of his work. Instead of occupying himself with the experimental proof of his sentence—instead of showing that tannin gallic acid, &c., are absorbents of iodine—he mentions these chiefly in their quality as reducing substances.

But between a body which reduces and one which absorbs iodine there is a difference: *e. g.*, protosulphate of iron is a reducing substance, but does not absorb free iodine. [Why this operates, however, under certain circumstances, as a sensitizer I will hereafter show.] Nitrate of silver and nitrate of mercury are *oxidizing* substances, and powerfully absorb free iodine.

In my investigation, on the other hand, I produced the experimental proof that the otherwise heterogeneous bodies, *nitrate of silver* and tannin, have the common quality of absorbing iodine. From this I drew the conclusion that other bodies, which were absorbents of iodine, could have the same effect on iodide of silver as the above-mentioned bodies, and proved the correctness of this supposition by experiments with the bodies which are universally known as absorbent of iodine, viz., protochloride of tin and arseniate of sodium, &c., bodies whose examination in their relation to iodide of silver is so intimately connected that M. Poitevin, as an eminent chemist, would certainly not have left these unexamined, if he had been clearly conscious of the fact, which has been demonstrated by me, especially as the establishment of such a fundamental principle is, doubtless, more important than the description of a new dry process.

Since, therefore, M. Poitevin says, "Je reclame donc, comme déjà *enoncés*, par moi, les résultats auxquels est arrivé M. Vogel" ("I claim for myself, as already announced, the results which Herr Vogel has obtained.")

I would remark, in reply, that a simple announcement (*enoncé*) by no means constitutes a new discovery. Unacquainted with the idea of M. Poitevin, I have not merely satisfied myself with the announcement, but have *logically developed* and *experimentally proved* the fact which I have asserted.

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PERFECTION OF IRON DEVELOPERS.

BY M. MC. A. GAUDIN.

For some time past the question of a modification in the preparation of ferric developers has frequently been raised, apparently with much benefit.

The diversity of action in the developers prepared with salts of iron is very great. It is caused chiefly by the nature of the acid combined with the iron; so that it is necessary to make the preparation according to the effect intended to be produced.

Nitrate of iron acts very slowly in producing a crystalline deposit white as snow, which, unfortunately, lacks continuity in the half-tones. Proto-sulphate of iron, strongly acidulated with sulphate of iron, also gives a white crystalline deposit which is of marvellous fidelity; but its action is excessively rapid, and it never passes beyond a transparent grey hue. Acetate of iron, on the contrary, gives a silver deposit with a yellow tinge, which forms slowly and with great continuity.

From this it is evident that the nitrate and sulphate of iron, without acetic acid, can serve only to produce positives on glass, or on oil-cloth, a process of very limited application, used at the present day by amateurs only, it being unfitted for producing copies. This very clearly explains the immense development taken by photography on paper, for successful positives on glass present the perfection of Daguerreotypes, with the advantage of being in correct position and free from metallic reflection.

In order to succeed, a host of conditions which practice has always eluded must be combined, and then we obtain charming pictures without distortion, which exhibit stereoscopic relief. We must employ a simple achromatic objective; the collodion must be prepared with lightly rectified ether and alcohol, making the latter as dominant as possible, with the view of obtaining a perfectly uniform film; on the other hand, if we wish to transfer the picture to oil-cloth, ether must predominate. The collodion must be very feebly iodized. Sensitizing must be performed in a completely darkened place, without even the light of a candle, if we wish to obtain fine blacks: never to make use of cyanide of potassium for fixing, for it immediately corrodes all the fine parts of the picture. The depreciation of this process is due to the recommendation of cyanide of potassium by ignorant authors.

To develop the picture in perfection, instead of throwing the ferric developer over the whole plate at once, suddenly, I recommend immersing the plate, picture downwards, in a copious bath, without leaving hold of the plate, which presents the advantage of retaining the free nitrate much longer; and this is essential to development.

The following improvement is applicable to all the ferric developers: it consists simply in adding some *sugar* or *gelatine* to the solution, which assists in the formation of the picture by a complex action, resulting partly from the combination of these ingredients with the ferric salt, which retards and regulates the coming of the picture, just as the acetate does, and besides, the mixture spreads over the plate readily without the addition of alcohol, which is a great point.

Thus, by the addition of sugar or of gelatine in large proportion, we are in future certain of being able to pour the iron developers over the plate without brusqueness, and without pouring them off and on, and thus obtaining the advantage of a more gradual action, and a greater opacity with uniform silver deposit. All the accounts of experiments made in this direction that I have read leave me no doubt on this head.—*La Lumière.*

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CLOUDS IN LANDSCAPES.

Cressida.—O, he smiles valiantly.
Pandarus.—Does he not?
Cressida.—O, yes, an 'twere a *cloud* in AUTUMN!
Shakspeare.

Sir,—It is a vain thing for a man to say, "I will go thus far into an argument, and no further." When I addressed you some weeks ago on the "Sphere and Scope of Photography in Art," I resolved to enter into no controversy. Fortunately, no occasion has offered on the main question. One of your correspondents, subscribing himself "An Artist," has, however, whilst agreeing with me generally, taken exception to what he describes as my chief illustration, Mr. Robinson's "Autumn." That he should accept my argument and reject my illustration is a circumstance to which I cannot possibly object, nor is it of very vital importance that he should cite as that chief illustration another picture of Mr. Robinson's, and not that upon which my remarks were chiefly based; but it does lead one to suspect that "An Artist" is a very careless observer. I am quite willing, however, to accept the "Autumn" as my illustration, although on reference he will find that "Bringing Home the May" was the chief subject of comment. Whilst I have no intention whatever to enter into the discussion as to the artificial character of the "Autumn," I may be permitted to record my opinion, that—whilst I readily accept your dictum as to its actual history as photographed right from nature—even had it been as artificially produced as it is stated many of Gainsborough's best landscapes were, namely, from bits of stick, &c., formally arranged by hand, it presents itself to me, an artist and ardent student of nature, as one of the most charmingly natural and fresh landscapes, as well as one of the completest compositions, possible to be produced in monochrome by any process whatsoever, photographic or otherwise. A picture may, as "An Artist" observes, be taken from nature and not look like nature. How many photographs illustrate this! "An Artist" thinks that "Autumn" is one of these. Well, I don't think so; and "self-constituted authorities," as you pointed out anonymous correspondents to be, as another artist, I ask you to record my opinion on the subject. I suppose artists may differ, as doctors do, without much harm being done. Meanwhile, so far as opinions go, a "discerning public" will generally form its own.

My object in writing is not, however, simply to record an opinion different from that of "An Artist," whom I cannot help thinking you used a little severely in your notes to his letters. I wish to offer one or two remarks on clouds in landscapes, which one sentence in your correspondent's letter has suggested. In referring to one of the figures in "Autumn" as under a cloud, he remarks that "the heavy mass of dark" is "as unlike the delicate shadow a cloud casts over the landscape on a sunny day as it well could be." This sentence leads me to think that "An Artist" is as imperfect an observer of nature as he has proved himself a careless reader in attributing to me one illustration when I used another. From the remark I have quoted it would appear that "An Artist" regards all clouds as of one definite character, and all the shadows they cast on sunny days as of one depth, and "delicate." How little he must have studied the glorious clouds! The most changeful objects in creation, the most varied in their range of change, and beautiful in their every variation, from the filmy wreath, finer than the finest gossamer, to the portentous storm-cloud, black as night, a "terror and a glory." I love the clouds: they have been my companions on many lonely wanderings on land; they have been my companions when thousands of miles at sea; and they have often seemed to my imagination instinct with life, beings of an unknown nature, which soared above our world, within its ken, but deigning to hold no commerce with it. The "delicate shadows of a cloud on a sunny day!" There are such delicate shadows; but there are shadows which fall almost like an eclipse. I remember a storm-cloud at sea: the day was as bright and sunny as a maiden's smile; the blue waves leaped in the sun, and the bow of the vessel seemed studded with diamonds, as it rapidly cleft the water. Suddenly an ominous look on the face of the captain turned our attention to the weather quarter, and we saw rapidly travelling towards us a mass of cloud as dark as night and heavy-looking as lead; the sea, beneath its shadows, was like ink; it travelled on with great rapidity, the sunny-blue water being covered as with a pall as it approached. It passed us, the squall which hurried it forward making our good ship stagger like a drunken man as it struck us in passing. We were drenched to the skin when it had passed; and all this scene rose vividly to my memory when I read the sentence which referred to the delicate shadow cast by a cloud on a sunny day. The day after I read the sentence I was walking in a lovely midlandshire lane, on a bright sunny Sunday morning. There was a brisk wind, a glorious sky shone clear and blue far overhead, masses of white clouds a little below, apparently, scarcely moving, and a still lower stratum of darker clouds appeared scudding rapidly before the wind. These latter clouds gave a charming diversity to the landscape; at times a thin wreath of broken cloud passed between the landscape and the sun, and a "delicate" shadow flitted rapidly over the fields: now a blacker, bigger, denser mass of cloud intervened, and the shadow was black and heavy, and spread a broad sombre dulness over half the scene. They passed, and others followed, giving every gradation of shade, and I smiled as I thought of the wonderful emblem of unvarying definiteness expressed in your correspondent's idea of a cloud-shadow.

If my observation of nature had not taught me that clouds might cast something more than delicate shadows on a sunny day, my reading would have suggested it. If your space would permit, I might easily fill a column with allusions from Shakespeare alone, with whom the clouds are favourite emblems. When, for instance, adversity casts a passing shadow on Edward's career, he exclaims:—

> "But in the midst of this bright shining day,
> I spy a black, suspicious, threatening cloud."

I should have liked to quote from Ruskin at some length on this subject, if I did not fear trespassing on your space; but I will just transcribe a few sentences. He is describing the formation of clouds on a bright day amongst the mountains. He has watched a glorious day-break and sunny morning, followed by mist-wreaths forming themselves into clouds; these at length become "massy and motionless, only piled every instant higher and higher into the sky, and casting longer shadows athwart the rocks; and out of the pale blue of the horizon you will see forming and advancing a troop of narrow dark pointed vapours which will cover the sky inch by inch with their grey net-work, and take the light off the landscape with an eclipse which will stop the singing of the birds and the motions of the leaves together; and then you will see horizontal bars of *black shadow forming under them*." I do not know under what circumstances Mr. Robinson's "Autumn" was taken, but I can see that Ruskin has described just the circumstances under which it might have been taken, when the clouds which cast horizontal bars of black shadow on portions of the landscape have just crept into part of the foreground, whilst all the rest is still bright and radiant.

The clouds have to play a far more important part in photographic landscapes than they have yet done. I do not say that a photograph without a sky, or with a mass of white for the sky, is altogether unnatural, but, to me, it is very tame, insipid, and unpoetical. How a photographer with a conception of the enormous resources he possesses in the clouds can ever neglect them in his landscapes I cannot understand. They have such a varied beauty in themselves; they give to the artist such a command in balancing and harmonizing his composition; if well managed, they so assist everything else in taking its place, that I cannot understand their frequent neglect by the photographer. One reason is, I know, the difficulty of securing them in the same negative as the foreground. If I am right in my former letter on the legitimacy of combination in photography, then there should not be a second opinion as to the propriety of using a second negative, looking to it, however, that the clouds harmonize with the picture and involve no impossibility or practical solecism. To avoid this a careful and constant study of nature, as well as art, will be necessary. Heed not, I would say to the photographer, the thoughtless objector, or bogus critic, who tells you that the landscape can only harmonize with that sky with which it was illumined when you obtained your negative. Remember that the portion of the sky which produces lights or shadows on your landscape is rarely that which the eye sees in looking at that landscape. How far this is true you will ascertain by the study of nature, and of all the studies of beauty known to man, there is none so grand, so lofty, and so varied as the study of the aspects of the sky and the glories of the clouds. And when, with Ruskin, you have gazed on a glorious sunset "through its purple lines of lifted cloud, casting a new glory on every wreath as it passes by, until the whole heaven, one scarlet canopy, is interwoven with a roof of waving flame, and tossing vault beyond vault, as with the drifted wings of many companies of angels; and then, when you can look no more for gladness, and when you are bowed down with fear and love of the Maker and Doer of this, tell me who has best delivered his message unto men." Respice Finem.

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British Association for the Advancement of Science.

We proceed to make a few extracts from such portions of the proceedings of the British Association as will, we think, interest our readers.

Photoheliographs.

From the report of the Kew Committee we learn that photography has received increased attention as a means of scientific registration.

At the request of Mr. Charles Cator, an anemometer of his construction has been tested at the Observatory, and the results communicated to him. Also, at the request of Professor Roscoe, the photographic action of total daylight is daily registered by an apparatus of his construction. The Kew Heliograph, in charge of Mr. De La Rue, continues to be worked by a qualified assistant, who gives much satisfaction. During the past year, 243 negatives have been taken on 146 days, and four sets of positives have been printed from each, some of which have been given to men of science interested in this branch of research. The negatives are being reduced under the superintendence of Mr. De La Rue, and by means of an instrument of his own construction, which he has generously presented to the Kew Committee. Mr. B. Loewy has been engaged in the reduction, which he is executing satisfactorily.

It was mentioned in last report that an addition to the micrometer was in the course of construction, by means of which the proportion of the sun's disc obscured by spots might be conveniently measured. This arrangement is now completed; and the materials for measurement have been greatly increased, through the kindness of Mr. Carrington, who has placed his original drawings, in which the size and appearance of the spots are delineated with great fidelity, at the disposal of the Kew Observatory. It may be desirable to state, in a few words, the proposed method of exhibiting the results of these reductions. In the progress of this branch of knowledge observers have been led to recognize certain laws, which represent the average behaviour of sun spots, but to all of these laws there are individual exceptions. In this state of things it is probable that our knowledge of the subject will ultimately be advanced, not only by a study of those groups which behave in a normal manner, but also by a study of those which are exceptions in their behaviour to the general rule; and on this account it has been thought desirable to publish the results in such a way that any one may be able to study the appearance and behaviour—in fact, the whole history of any one group. In order to accomplish this a lens is being made by Dallmeyer, by means of which individual groups may be magnified to a scale on which the diameter of the sun will be equal in size to two feet. The sun spots continue to be observed after the method of Hofrath Schwabe, of Dessau.

It has long been a desideratum in photoheliography, with the view of obtaining the apparent diameter of the sun's disc, to ascertain the *absolute* values in arc of the divisions of the measuring instrument (Mr. De la Rue's Micrometer), and preliminary experiments were made with that object during the period that the heliograph was at the Cranford Observatory. These were only partially successful. The mode of operation was this: a suitable object, sufficiently distant, was photographed by means of the Kew instrument, with the lenses in the same positions as when solar pictures were taken. Different portions of the object (windows, doors, &c., of a house, for example) were then carefully measured so as to ascertain their value in minutes and seconds of arc; and by measuring the pictures of these several portions with the arbitrary scale of the Micrometer, the value of the latter in arc could be calculated. The experiments did not succeed so well as could have been desired, in consequence of the disturbance of the images by the undulations of the atmosphere, none but very low objects coming within the desired range. More recently, however, the experiments have been taken up again with great promise, and excellent photographs of the Kew Pagoda have been obtained, which possess the requisite sharpness. The object itself, on account of its numerous galleries, is peculiarly fitted for such observations, as it will be possible to ascertain and allow for any optical distortion of the photographic image. Thus it is not improbable that the Pagoda will afford the means of ascertaining, photographically, with the greatest accuracy, the angular diameter of the sun, and will give data for correcting the assumed semidiameter of the moon, by the discussion of photographic pictures of solar eclipses.

The Action of Light on Sulphide of Lead.

A paper on the action of light upon sulphide of lead, and its bearing upon the preservation of paintings in picture galleries, was read by the author, Dr. D. S. Price. The author's attention was directed to this subject by observing that in the cases in the South Kensington Museum, which are painted with white lead, that substances which emitted sulphurous vapours did not cause a darkening of the surface of the case, excepting where it was protected from the direct influence of light. A number of experiments was then tried as to the action of light upon sulphide of lead produced by the action of sulphuretted hydrogen on lead paint. A board painted white with white lead was exposed for several hours to the action of sulphuretted hydrogen, until the surface had acquired a uniform brown colour. Plates of glass of different colours were then placed upon the painted surface, one portion being at the same time covered with an opaque medium, and another left entirely exposed. The board was then placed facing the light. The glasses employed were red, blue, yellow (silver), violet, and smoke-colour glass. The results exhibited were after an exposure of eight days, and showed that the parts of the board directly exposed to light were bleached; those protected by an opaque medium were not acted upon, while with the glasses of different colours intermediate effects were produced, those of the violet glass being most decided. Drying oils in conjunction with light rapidly bleach sulphide of lead, and boiled oil effects the bleaching still more rapidly. When water colour is used bleaching takes place, but much more slowly than in the case of oil. After quoting authorities, stating that generally light was advantageous to the preservation of pictures, Dr. Price showed a striking illustration of this fact. He had a picture painted, and then exposed it to the action of sulphuretted hydrogen, until it became sadly discoloured, and to all appearance destroyed. Some strips of paper were laid across the picture, so as to cover some parts. The picture thus partially covered, was exposed to light for a long time, the result, as shown at the meeting, was curious indeed, the parts of the picture exposed being perfectly restored, while those protected by the paper remained still discoloured. From his experiments he came to the conclusion that it was advantageous to have picture galleries well lighted, especially where, as in towns, the atmosphere was charged with sulphur compounds, and that it was quite a mistake to have curtains placed in front of pictures, with a view to their protection. In the course of his communication Dr. Price referred to the use of zinc paint for houses, and considered it likely to be acted upon, as the paint was rendered soluble by the acids contained in the atmosphere of towns.

Professor Hoffman, confirmatory of the lecturer's remarks, also observed that blue, which had become faded, when exposed to light assumed its almost original brightness. This accorded with the evidence of Mr. Farren, F.R.S., &c., who had exposed a picture to the light, when the blue portion of which had greatly faded became restored.

Dr. Voelcker, in connection with the action of light on colours, referred to a common mode of improving the colours of silks by placing them in the dark after they have become faded.

Professor Abel quoted an instance in which light was essential to the production of colour in the preparation of phosphide of lead by the action of phosphuretted hydrogen on a salt of lead.

Mr. **Geo. Wallace**, Head Master of the Art Division at the South Kensington Museum, also made several observations, and instanced the fact that some old picture dealers, not very careful of truth, were accustomed to make new pictures look like old ones by the method described. He did not know whether he ought to say so, as it would probably go forth to the public, but it was a fact that the air of South Kensington was purer and better for the preservation of pictures than that of the National Gallery. A landscape exhibited by the lecturer had a very amusing appearance—the parts covered by an opaque medium retaining their original colours; those portions exposed to the light looking as if mellowed down by age, or rather as if they had undergone an extraordinary whitening process.

BRITISH PHARMACEUTICAL CONFERENCE.

At the British Pharmaceutical Conference, which holds its meetings at the same time as the British Association, some interesting papers were read.

Methylated Spirits.

Several papers were read on the use of preparations from methylated spirit :—"On methylated chloroform, ether, sweet spirit of nitre, and sal volatile," by Mr. John Tuck. The author summed up his results by stating that chloroform could be and was prepared from methylated spirit as good, and the same in chemical composition, as that from alcohol; consequently there could be no test to distinguish between them, there being no difference in them. Methylated ether could principally be detected by its boiling point. The presence of methylic alcohol in sweet nitre and sal volatile could be thoroughly proved, both by the iodo-hydrargyride of potassium and oxidation tests.

"On Eschwege's Patent Wood Naptha." As is well known, this patent naptha is ordinary wood naptha, which has been purified by diluting with water, filtering through deep layers of animal charcoal, and subsequently distilling and rectifying. The author now proposed its use in making delicate perfumes and toilet soaps, and exhibited specimens illustrating his remarks. Its lower boiling point, also, pointed to its use in making cooling lotions; and its comparative lowness of price recommended it to naturalists for preserving specimens. It was also said to possess advantages over ether in making collodion.

"On the soda-hydrargyride of potassium," and "Oxidation tests for methylic alcohol in the presence of ethylic alcohol, or other organic bodies." The author had previously found that the alkaline solution of the soda compound gave a yellowish white precipitate with spirit of wine, but none with methylated spirit, owing to the presence of acetone. He had now tried the test on all the tincture of the pharmacopœia, and found that although many bodies besides acetone prevented the formation of the precipitate, yet that none of these came over in distilling the tincture. The distillate of every tincture prepared with pure spirit gave the precipitate; while no precipitate was obtained from those prepared with methylated spirit. He then strongly eulogised Mr. Miller's oxidation test for methylic alcohol, which has for its object the formation and detection of formic acid, no important amount of that body being producible under the same circumstances from ethylic alcohol.

Mr. Tuck exhibited to the meeting several specimens of whisky, brandy, and other spiritous and medicinal shams made from methylated spirit.

Bromides and Iodides.

"On the Purity of Bromides and Iodides other than Iodide of Potassium." By Mr. Henry Matthews, F.C.S.—The author gave complete analyses of nineteen specimens of the above-named salts. The results showed that the bromides of ammonium and of cadmium, and also iodide of cadmium, are practically pure, but the same cannot be said of the bromide of potassium. Of seven samples of this salt, the contained chloride ranged from 0 to 5 per cent; the iodide from 0 to 3·88 per cent. Smaller quantities of sulphate and bromate were also present usually. The largest amount of impurity was found in the iodide of ammonium, two samples out of three examined giving from 6 to 7 per cent of sulphate of ammonia. The method of analysis was fully detailed.

Acetic Acid.

"Report on the processes for the preparation of Glacial Acetic Acid," by W. E. Heathfield.—After remarking on the sources of acetic acid, as obtained principally from wood, Mr. Heathfield described the process for the preparation of the officinal and the glacial acetic acids by the action of sulphuric acid on acetate of soda, remarking on that as formerly adopted, and on the processes of the British and the United States Pharmacopæia, as well as some of the continental formulæ. He described the earlier processes for its manufacture, showing that the present means adopted for the production of glacial acetic acid vary but little from those formerly adopted. He alluded in detail to the process of M. Melsens, and explained the theory put forward of its production. He entered briefly into the modes of estimation of the strength of acetic acid, and explained how inadequate was means of taking the specific gravity, showing that the mono-hydrated acid, containing 100 per cent. of the aqueous acid, may be mixed with 51½ per cent. of water, and yet indicate the same gravity. He also gave a table of the relations of specific gravity to strength. In alluding to the various modes now adopted for such estimations, the writer indicated his opinion that the saturating power of acetic acid was the true means of estimation; further, that no process appears to have been yet devised superior to that of Melsens.

Tannin.

On "The amount of Tannin in British Galls at different periods of their growth," by W. Judd, F.C.S.—Old galls which had remained on the oaks till after Christmas, and had, of course, been perforated by the fly, were found to contain 16 per cent. of tannin. Mature galls, but from which the fly had not escaped, yielded between 17 and 18 per cent., while half-developed galls afforded only 13 to 14 per cent. Though Aleppo galls contain two or three times this amount of tannin, still English galls, the author thought, could be economically used in dyeing, ink-making, tanning, etc., if collected at the proper period of the year.

Proceedings of Societies.

Amateur Photographic Association.

A council meeting for the award of prizes was held Aug. 12th, at 12, York Place, Portman Square. Sir Thomas Maryon Wilson, Bart., in the chair. The minutes of the last meeting having been read and confirmed, Mr. Glaisher read a very elaborate report on the pictures contributed for the present year, of which the following is an abstract :—

In Class I. there were 85 pictures contributed as follows :—J. W. Rimington, Esq., 12; Capt. G. Bankart, 9; Messrs. Lloyd and Howard, 6; H. Cooper, Esq., Jun., 6; C. A. D. Halford, Esq., 6; W. D. Hemphill, Esq., 5; G. Bevington, Esq., 4; N. K. Cherrill, Esq., 4; T. Brownrigg, Esq., 3; M. Allport, Esq., 3; F. R. Barclay, Esq., 2; J. Clerk, Esq., 2; Col. C. Holder, 2; Sir J. J. Coghill, 2; F. R. Griffith, Esq., 2; Capt. Mason, 2; Major Gresley, 2; G. Wales, Esq., 2; Rev. F. E. Gutteres, 2; Hon. N. Jocelyn, 1; the Viscountess Jocelyn, 1; St. J. Coventry, Esq., 1; W. Sandy, Esq., 1; A. Suzanne, Esq., 1; W. L. Banks, Esq., 1; G. H. Hodges, Esq., 1; F. Beasley, Esq., 1; F. E. Currey, Esq., 1; J. S. K. Moss, Esq., 1.

In Class II. there were 106 pictures contributed as follows :—J. W. Rimington, Esq., 15; C. A. D. Halford, Esq., 12; N. K. Cherrill, Esq., 8; H. Cooper, Esq., Jun., 7; W. D. Hemphill, Esq., M.D., 6; Capt. G. Bankart, 5; Messrs. Lloyd and Howard, 5; J Clerk, Esq., 4; G. Bovington, Esq., 8; T. Brownrigg, Esq., 3; F. Beasley, Esq., 3; Major F. Gresley, 2; Sir J. J. Coghill, 2; M. Allport, Esq., 2; W. L. Banks, Esq., 2; F. E. Currey, Esq., 2; Capt. Mason, 2; W. Sandy, Esq., 2; W. H. Simpson, Esq., 2; C. Stephens, Esq., 2; W. W. King, Esq., 2; the Hon. N. Jocelyn, 2; J. Wales, Esq., 2; Rev. F. E. Gutteros, 1; J. S. K. Moss, Esq., 1; F. R. Barclay, Esq., 1; Hon. Miss A. Crofton, 1; J. A. Silk, Esq., 1; Miss E. Scott, 1; J. Rivington, Esq., 1; J. W. Richardson, 1; F. R. Griffith, Esq., 1; D. Lauric, Esq., 1; W. R. Penn, Esq., 1.

In Class III. there were 123 pictures contributed as follows :—J. Clerk, Esq., 15; J. W. Rimington, Esq.. 12; N. K. Cherrill, Esq., 10; F. R. Griffith, Esq. 7; Capt. G. Bankart, 6; Messrs

Lloyd and Howard, 6; C. A. D. Halford, Esq., 5; G. H. Hodges, Esq., 5; Miss L. Ramsden, 4; Capt. Playfair, 4; W. S. Hobsou, Esq., 3; O. J. Jones, Esq., 3; G. Bevington, Esq., 3; W. D. Hemphill, Esq., M.D., 3; J. S. K. Moss, Esq., 2; F. R. Barclay, Esq., 2; R. B. Bowman, Esq., 2; G. D. Atherstone, Esq., 2; T. Brownrigg, Esq., 2; A. Suzanne, Esq., 2; W. W. King, Esq., 2; Hon. N. Jocelyn, 2; A. Booty, Esq., 2; H. Wood, Esq., 2; Major Gresley, 1; Rev. F. E. Gutteres, 1; W. L. Banks, Esq., 1; The Viscountess Jocelyn, 1; St. J. Coventry, Esq., 1; W. Sandy, Esq., 1; Miss E. Scott, 1; W. H. Simpson, Esq., 1; E. L. Williams, Esq., 1; T. Bell, Esq., 1; Col. Durnford, 1; J. Middleton, Esq., 1; Miss C. Powell, 1; W. G. Atherstone, Esq., 1; Hon. Miss A. Crofton, 1; Capt. M. Hutton, 1; W. R. Penn, Esq., 1.

In Class IV. there were 107 pictures contributed as follows:— N. K. Cherrill, Esq., 7; O. J. Jones, Esq., 7; F. Beasley, Esq., 6; Miss C. Powell, 6; A. Gray, Esq., 6; J. Rivington, Esq., 5; Rev. F. E. Gutteres, 4; J. W. Rimington, Esq., 4; F. R. Barclay, Esq., 4; Col. Durnford, 4; Messrs. Lloyd and Howard, 3; W. W. King, Esq., 3; Hon. N. Jocelyn, 3; W. H. Simpson, Esq., 3; G. H. Hodges, Esq., 2; Captain Playfair, 3; C. A. D. Halford, 2; J. A. Silk, Esq., 2; Miss E. Scott, 2; J. Richardson, Esq., 2; E. L. Williams, Esq., 2; A. Booty, Esq., 2; W. S. Hobson, Esq., 2; W. D. Price, Esq., 2; R. Milligan, Esq., 2; Capt. M. Layton, 2; Major F. Gresley, 2; G. Bevington, Esq., 1; W. L. Banks, Esq., 1; W. D. Hemphill, Esq., 1; J. S. K. Moss, Esq., 1; T. Brownrigg, Esq. 1; T. Bell, Esq., 1; J. Middleton, Esq. 1; J J. Cotton, 1; W. G. Hunter, Esq., 1; Dorabgee Pudumgeo, Esq., 1; J. Taylor, Esq., 1; H. O. Cholmondeley, Esq., 1; R. Mornay, Esq., 1; E. H. Clark, Esq., 1; W. R. Penn, Esq., 1.

Class V. comprises a very large number of pictures, many of which are very good, but which it is impossible to mention in detail.

The following prizes were awarded:—

To Messrs. F. H. Lloyd and W. D. Howard, a silver goblet, value seven guineas, for a pair of 9 by 7 pictures, "Views in the Tyrol."

To J. W. Rimington, Esq., 3 prizes, viz.:—a silver goblet, value four guineas, for a pair of 7 by 5, instantaneous sea picture, "Off Cowes;" a photographic album, value one guinea and a-half, for a 7 by 5 picture, "In the meadows near Winchelsea."

A ditto, ditto, for a 7 by 5 picture, "A Study of Foliage."

To H. Cooper, Esq. jun., a silver goblet, value five guineas, for a pair ot 7 by 5 pictures, "Charles Surface," and "Charles Surface discovers Lady Teazle."

To Capt. G. Bankhart, a silver goblet, value five guineas, for a pair of 12 by 10 pictures, "Rustic Cottages."

Sir J. J. Coghill, Bart., a silver goblet, value five guineas, for a pair of 9 by 7 pictures, "Views near Castle Townsend."

W. D. Hemphill, Esq., a silver goblet, value four guineas, for a 10 by 8 picture, "Kilmanahan Castle."

N. K. Cherrill, Esq., a silver goblet, value four guines, for a pair of 7 by 5 portraits of "Horses."

F. R. Barclay, Esq., an elegant photographic album, with silver plate, for a pair of 12 by 8 Pantascopic pictures, "Views at Bury Hill."

F. E. Curry, Esq., a ditto, ditto, for a 9 by 7 picture, "View in Ouinshade Glen."

Major F. Gresley, a ditto, ditto, for a 12 by 10 picture, "Group of Firs."

F. Beasley, Jun., Esq., a ditto, ditto, for a 10 by 8 picture, "Hungerford Church."

G. Bevington, Esq , a ditto, ditto, for a 7 by 5 picture, "Wreck of the Devereux" (instantaneous).

J. Clerk, Esq., a ditto, ditto, for a 12 by 10 picture, "View at Penicuik."

The Viscountess Jocelyn, a handsome photographic album, for a 9 by 7 picture, "An Interior."

Col. C. Holder, a ditto, for a 10 by 8 picture, "Lake and Pleasure Grounds, Newick Park."

W. Sandy, Esq., a ditto, for a 9 by 7 picture, "View in Saltburn Glen."

G. H. Hodges, Esq., a ditto, for a 10 by 8 picture, "View in Grace Dieu Park."

W. L. Banks, Esq., a ditto, for a 10 by 8 picture, "View in Casscoburg Park."

Rev. F. C. Gutteres, a ditto, for a stereoscopic picture, "Cutter Manned and Armed" (Instantaneous).

T. Browurigg, Esq., a ditto, for a stereoscopic picture, "Druids' Glen."

Certificates of honourable mention were awarded to:—Major F. Gresley; G. Bevington, Esq.; Sir J. J. Coghill, Bart.; Rev. F. E. Gutteres; C. A. D. Halford, Esq.; W. D. Kemphill, Esq., M.D.; F. E. Currey, Esq.; J. S. K. Moss, Esq.; F. R. Barclay, Esq.; J. W. Rimington, Esq.; T. Brownrigg, Esq.; N. K. Cherrill, Esq.; Capt. Mason; the Viscountess Jocelyn; St. J. Coventry, Esq.; Messrs. Lloyd and Howard; Capt. G. Bankart; F. R. Griffith, Esq.; J. Clerk, Esq.; J. A. Silk, Esq.; J. Walos, Esq.; J. Rivington, Esq.; A. Suzanne, Esq.; W. W. King, Esq.; Hon. N. Jocelyn.

The pictures sent this year were about equal in number to those of last, but were on the whole decidedly superior in quality. Indeed, the Council cannot expect a much higher average than is presented this year. Although so large an amount has been awarded in prizes, the Council found more difficulty this time than ever in making a satisfactory award, having been compelled to pass some pictures that well deserved a prile. Amongst which may be mentioned some large Indian pictures by F. R. Griffith, Esq.; several beautitul interiors by C. A. D. Halford, Esq.; and some stereos by M. Allport, Esq. Dr. Wilson has sent some excellent micro-photographs, and Mr. C. S. Harris some flower studies, which, although they can hardly be placed in any particular class, yet must not be passed without some notice.

A vote of thanks was then passed, at the motion of Mr. Shadbolt, to Mr. Glaisher, for his very able and valuable report.

The following members were elected:—

Viscount Strathallan	J. W. Jennings, Esq.
S. W. Williams, Esq.	Elias Howard, Esq.

The proceedings then terminated.

A. J. Melhuish.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, September 20th, 1865.

Yesterday I visited the Exhibition of the Fine Arts applied to Industry, which is at present open in the Palace of Industry. I expected to find photography worthily and largely represented there. Indeed, as the disciples of Niepce and Daguerre reasonably complain of being excluded from the annual *salon*, and of being consigned to the same place as manufacturers and artisans, they ought promptly to have seized this opportunity of taking a distinguished place among the artists by whose works industry is elevated and developed. Five or six photographers alone have taken part in this exhibition.

First I will mention the specimens of photography exhibited by M. Marie, and which certainly excel everything of the kind hitherto done. A portrait of the king of Prussia, from a *cliché* by Pierre Petit, is especially deserving of notice for its great distinctness and excellent modelage. Several views from M. Ferrier's *clichés* are also very successful. One of them is printed with several stones in chromolithography. It is evident that M. Marie has greatly improved the processes already known, and has rendered them much easier in practice.

M. Despaquis exhibits some fine reproductions of engravings, and some very good carbon portraits (Poitevin's process of 1855, with bichromated gelatine). The modelage of the faces is very good. Unfortunately, the tone of the pictures is somewhat cold, but that arises from the composition of the powder employed. By adding to it a little carmine, or a little red chalk, warmer tones could easily have been obtained.

Photosculpture is splendidly represented at this exhibition by a table covered with busts, statuettes, and medallions in plaster, in terra-cotta, and in biscuit porcelain. This ingenious invention has made great progress during the last year. The figures are living, their flesh is palpitating, and, under the stuffs which drape it, the whole body seems to be in movement. It is of a truthfulness which strikes and seizes the beholders, but which does not exclude the charm which artistic handling can give. Some of the statues of woman, that of the Queen of Spain, for instance, and a beautiful bust which calls to mind our sculptor Couston, are really masterpieces.

Messrs. Lambert, Thiboust, and Laveaud, have sent excellent portraits, and very remarkable reproductions of objects of art and of industrial models. Messrs. Ferdinand Mulnier and Marte complete this short nomenclature by some fine portraits.

M. Schiertz has several "American" stereoscopes supplied with the beautiful views of Messrs. Ferrier and Soulier.

This is about all that has been sent to the exhibition by photographers; but in most of the show-cases of the jewellers, goldsmiths, and cabinet-makers, mechanics, coachmakers, &c., I found photographic reproductions of the objects they were unable to exhibit, or of the most important pieces to which they desired to call the more particular attention of the public. Manufacturers now understand the valuable services that photography can render them for the popularization of their productions, and this application has, in the last few years, taken a development which is very noteworthy.

It would be desirable that the French Photographic Society, whose exhibition has now terminated, should open its contiguous galleries gratuitously for the visitors to the Exhibition of the Fine Arts applied to Industry, of which the galleries would thus become an annex. In this manner, photography would be worthily represented, and the public would form a more accurate idea of the progress made by the new art. Ernest Lacan.

THE NORTH-LONDON MEDALS.

Sir,—I am one of those whom you designate, with more point than courtesy, "disappointed exhibitors," but I have awaited the publication of the Report of the Jurors before I gave expression to any feeling on the subject. I am not going to imitate the spirit of indecent self-laudation which has characterized the protests of some of the workmen who have contributed specimens of their cabinet-work: and for this reason, and because I do not care to parade myself amongst those who know me, as a disappointed man, I send my name in confidence and not for publication. But I should like to know why, since a medal was offered for the most artistic pictures, one was not given to the best of those which did compete? Since a medal was offered for the best enlargement, why, I should like to know, was not one given to the best exhibited, since it is admitted that some were good? And I further think that, for the satisfaction of exhibitors generally, some answer should be given to the charges made in the protests published, as the fact that the protests are egotistical and in bad taste does not lessen the weight of the facts alleged, namely, that one exhibitor was favoured with a private interview with the jurors, and that the cameras of others were condemned for some of the same features of construction which were rewarded with a medal in the camera of the favoured exhibitor, and, further, that the said camera was simply a copy of those of some of the other makers. I think some satisfaction on these points is due to us, although I am bound at the same time to say that I had every confidence in the ability and character of the jurors, or I should not have competed for medals which I knew that they had to award.—Yours, An Unsuccessful Competitor.

[We should have thought that the Report of the Jurors was tolerably explanatory on almost all the points on which our correspondent desires information. In regard to the first question, we may state that, even if Mr. Robinson had not exhibited, it is most probable that the jurors would have declined awarding the medal for the most artistic pictures, inasmuch as, we believe, the majority of the jurors felt that none of the other contributions, except the landscapes of Mudd and Bedford, possessed sufficient artistic merit to be distinguished with a medal for that quality. Of course such a decision is open to competent criticism. It may be that the jurors set up too high a standard of artistic excellence. The same form of argument applies to the enlargements, on which our correspondent is, perhaps, naturally sore. The jurors, however, had a higher standard of excellence than the contributions reached. As for the foolish statements, in regard to which our correspondent thinks he ought to receive some information, we certainly should have scarcely considered them worthy of notice. We may say for his satisfaction, however, that there is not a word of truth in any of them. No exhibitor had any private interview, nor any privileges not possessed by all. The jurors examined the contributions of all the camera-makers carefully and impartially, and at such time as was convenient. They expressed no condemnation, such as one of the protesters describes, of any camera of any exhibitor. The medal was given for the greatest combination of good qualities in design, as expressed in the Report, and curiously enough, as we have been reminded since, the jurors of the Scottish Society gave a medal for the same camera some time ago, thus corroborating the judgment of the North London jury. Putting ourselves out of the question, we should feel it an insult to the gentlemen who were our colleagues in the jury to defend either their capacity or their honesty.—Ed.]

PHOTO-BINOGRAPHY.

Sir,—I read with interest your report of the meeting of the British Association, and also your remarks on photography so far as connected therewith. I was surprised that more papers or illustrations of our art-science were not presented. Photography is strong in the Midland Counties. There is, or used to be, a Birmingham Photographic Society; and are not Dr. Anthony and Dr. Hill Norris hosts in themselves? But the subject I fully expected would have been discussed was Mr. Pettitt's views on Photo-Binography. This gentleman, with great kindness, brought his pictures to London, read a paper descriptive of them, and, with some complacency, instituted comparisons with other methods of enlargement. It does not appear that Mr. Pettitt carried the feeling of the London Photographic Society with him. The chairman and members politely thanked him for his communication, but dissented from his views. Against this decision Mr. Pettitt appealed, and called for a committee of scientific men to judge his claims. In a short time after, the principal scientific men of the country came almost to Mr. Pettitt's door at Birmingham. I naturally thought that so unusual an opportunity would be eagerly seized, for if photographers themselves were too narrow in their views to appreciate Mr. Pettit, the scientific men would certainly be dispassionate in their judgment—the opportunity is so rare to get so many able men together, all bent on the same errand, the examination of novelties in science. Unless, therefore, it can be shown that such an effort was energetically made, this appeal for a scientific committee can only be regarded as an empty boast, and an unworthy manner of protesting against the decision of the society whose judgment Mr. Pettitt sought.

If a person really courts public examination, he should avail himself of all reasonable means; and if an unusual opportunity occur, he should make the most of it. Unless this be done, it is an abuse of the public journals for a person to trot out his hobby, claiming it to be this, that, and the other, but avoid the occasion when his assertions could be put to the test.

For some time past it was announced that there was to be a grand exhibition at Islington with an important photographic section. Prizes were to be given for the best pictures, and one in particular for the "best enlargement." Any one with a real desire for enquiry would have availed himself of such a chance as this, particularly when the occasion would afford the means of comparison with the old mode of enlargement. Surely it does not require a scientific commission to tell whether a life-size head has stereoscopic relief, or is as flat as a plane picture!

If a scientific committee were necessary, was not one here provided? While awaiting the decision of such *savans* as Wheatstone and Brewster, surely such men as Dr. Diamond

George Shadbolt, and yourself, might be listened to? When a person publicly claims, as Mr. Pettitt has in your columns, "the honour of having produced the first photographic picture in true perspective," to "substitute truth for fallacy," to "know that the only way to elevate photography into the dignity of a branch of the fine arts is by the pursuit of photo-binography," when a person claims all this, cries out for public enquiry, and clamours for scientific investigation, under these circumstances it is but the lowest degree of consistency to avail himself of accessible means of proving his high-sounding assertions. Observer.

[We did not see or hear anything of photo-binography at Birmingham, except that incidentally meeting a "mutual friend" of Professor Wheatstone and ourselves, he informed us that the Professor had received our communication regarding Mr. Pettitt's claims, and that, being unwell, his answer was for the present delayed. The gentleman to whom we have referred, himself distinguished by his contributions to optical science, hinted the nature of the answer we should receive; but it is unnecessary to anticipate, as our readers shall know the result when we hear from Professor Wheatstone.—Ed.]

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Photographic Notes and Queries.

Stains on Prints.

Sir,—I see in the Photographic News that one of your correspondents, "Smale," has been troubled with stains on the *back* of his pictures. Having once experienced something of this kind when printing in very hot weather similar to the present, I will, with your permission, give you the facts as they occurred to me.

When printing from a wax paper negative that required prolonged exposure, during very hot weather, and having printed a second picture, I found a positive picture on the back, which in this case happened to be inverted, or I might have mistaken it for the appearance due to printing deeply and through to the back of the paper. This occurred so constantly that when printing on thin albumen paper I was compelled to change the blotting-paper (two sheets) every time of printing, and I found that not only the sheet in contact with the first print, but the one behind, had the power of staining the back of the positive paper. When thick positive paper was used for printing, the stains seldom came through to the surface. The hypo solution did not always remove it. I never found this to occur with glass negatives; it was only with those on paper, and which were very dense, that gave the stains mentioned. If your correspondent would try the effect of using fresh and thick blotting-paper at each time of printing, I think he will find the stains he alludes to are caused by some action analogous to what I have mentioned. I do not venture on any explanation of the chemical action itself.—I remain, sir, yours truly,

John Stone.

5, Bernard Street, Regent's Park Road, N.W.,
Sept. 16th, 1865.

The Origin of the Tannin Process.

Sir,—In a recent number of the Photographic News you state, in answer to a correspondent, that Dr. Hill Norris was undoubtedly the first to use tannin in the preparation of dry plates; but you proceed further to say that "there is not a shadow of reason for doubting that the tannin process belongs entirely to Major Russell." I must confess myself quite unable to perceive the harmony between the two statements, and still less can I understand why you, who have always professed to be a stickler for historic truth, should make such discordant statements for the purpose of maintaining the doubtful claims of one who, if the explanations of Mr. Glaisher, at the Photographic Society, meant anything, had been doing his best in an underhand fashion to injure you. But to me there appears to be a curious want of clearness in the the case as it stands, and I shall be glad if you will find space in your columns for some questions on the subject, to which I should like answers from you or some of your correspondents.

1. Did Dr. Hill Norris actually try tannin in 1856, and with what result?

2. Tanno-gelatine is, if I rightly understand it, an insoluble substance formed by the action of tannic acid on gelatine. How could an insoluble substance be used as a preservative?

3. If Dr. Hill Norris first tried tannin as a preservative, why did he abandon it? And did any one work the process?

4. If Dr. Hill Norris first suggested or tried tannin as a preservative, why should the tannin process be said to "belong entirely to Major Russell"?—Very faithfully yours,

Historicus.

[It is unnecessary to enter into any comment as to our motives in rendering full credit to Major Russell further than to say that if there were any risk of a personal feeling influencing our comments, we should probably for that reason aim to do him more than justice, lest the circumstances should tempt us to do him less than justice. Regarding your questions, we will answer them to the best of our ability. Dr. Hill Norris was the first to try tannin as a preservative, and to publish it in 1856, as stated in our last; as to the result, it was, we believe, on the whole, less satisfactory than that of some other of the substances which he then tried. 2. If a solution of tannin be added to gelatine, a precipitate of tanno-gelatine is thrown down; this, however, Dr. Hill Norris found was subsequently redissolved, and it was a solution of gelatine containing tanno-gelatine which was used. He also first coated the collodion film with gelatine, and subsequently with tannin. 3. It was abandoned, we presume, because other substances were found in Dr. Hill Norris's experience to answer better. To what extent it was used at the time we cannot say, but we have recently been informed by a gentleman whose word and capacity we do not doubt, that shortly after Dr. Hill Norris published the statement to which we have referred, he proceeded to experiment, and as early as 1857 he actually employed the tannin process as it is used by many at this day. He first gave plates a preliminary coating of gelatine, then coated with collodion, excited, washed, and coated with a solution of tannin. This is no doubt a very singular statement; but one which we understand the gentleman will, in such time and place as seem to him good, publicly verify. 4. In consideration of these facts it was perhaps saying too much to remark that the process belonged without doubt entirely to Major Russell. What we meant to convey was our conviction that Major Russell had discovered the process independently, and that he had by the time, thought, and experiment, which he had devoted to the subject and liberally given to the public, acquired a property in the process which the public would readily acknowledge.—Ed.]

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Talk in the Studio.

Mr. Moens's Return.—The money article in the *Standard* says:—"A great scene of excitement was witnessed at the Stock Exchange shortly after the commencement of business. Mr. Moens, whose sojourn among the brigands in Italy till he was ransomed has been such a fertile topic of conversation, returned to the house to day, where he was received with every demonstration of satisfaction. The markets were thoroughly neglected for a time, the enthusiasm being of such a decided character that it was impossible to secure the attention of the dealers or obtain prices."

Carbon Prints.—Amongst the photographs exhibited at the last *soirée* of the British Association in Birmingham were some carbon prints by Mr. Swan which struck us as the finest we had seen anywhere.

Obernetter's Enamel Process.—The enamels by Obernetter's process exhibited at the *soirée* in Birmingham very much resembled those by Camarsac. Mr. Dale, a member of the firm which has purchased the process, described it to us briefly as follows:—A plate of glass is coated with a mixture of gelatine, glycerine, grape sugar, and bichromate of ammonia, and then exposed under a transparent positive. The light hardens the portions upon which it acts, and leaves the rest tacky. The colour, consisting of a vitreous powder mixed with soap-powder, is then applied to the surface, to which it adheres in due gradation. So far the process does not appear to differ materially from that of M. Joubert. Instead, however, of being burnt-in at once, the print is now transferred to a convex enamel plate. To effect this the picture is coated with collodion: the film of collodion being lifted up brings with it the picture, which is then placed on the enamel plate. The collodion is next removed by dissolving with ether, as it would interfere with the process of burning. The picture is then placed in the muffle and burnt in the usual manner.

Collodio-Chloride of Silver.—The editor of the *American Journal of Photography* says:—"Mr. Simpson's collodio-chloride process is turning out to be a great success. We have reports from various quarters, that it has been adopted into everyday use. So far as we are informed, all those who have tried it for opalotypes find it far more simple and certain than the processes which have hitherto been used in their production. The collodio-chloride seems to us one of the most important improvements in our art which has been made for a long time."

Photography and Popularity.—Photography has had one curious effect—it has made our remarkable characters familiar to the world. The features of almost everybody with a reputation are as well known now, thanks to the little carte-de-visite and the photographer's shop window, as if we were all on visiting terms with the notorieties. The moment anybody achieves a name, the public wants to have his portrait. The name may not be a very desirable one: a murderer, for example, will sell better than an actor, and an actor better than a statesman; but the taste of the day is for knowing "what manner of man it is." And since to be taken you must sit, it is clear that the notorieties meet the taste half way. The result has been a kind of personal meeting between the public and their leading men, which is good for both—we are speaking of the statesmen, not the murderers—and which the leading men show a wise desire to follow up by coming out of their official disguises and constantly appearing "au naturel."—*Daily Telegraph.*

To Correspondents.

The North London Medals.—We have received several letters on this subject commenting on the unseemly protests which have been made by certain exhibitors. One letter asking for certain explanations, with a note to it, will be found in another column; from the remainder of the letters we can only find space for extracts. One correspondent says: "It appears to me that the whole of the letters published, from that of Mr. Rejlander down to those of the camera makers, have their origin in a most offensive egotism, which in each instance assumes that the individual opinion of the writer is of infinitely greater value than the collective opinion of a body of independent jurors;" he further adds, "Mr. Rejlander, I presume, would have given a medal to Mr. Blanchard's 'Zealot' because it is a photograph of a figure with a name attached, like many of his own pictures; but he would not have given a medal to those glorious transcripts of nature in her sublimest moods, in which he sees nothing but quick exposure. The 'Zealot' is all very well, but it is a common-place embodiment of the artist's own conceptions, not to be compared in an artistic sense with a literal reproduction of the conceptions of the great Creator." Another correspondent makes himself merry with the arguments of those who first, in opposing medals, said nobody cared about them, and that they did not promote competition, now find an equally good argument against medals in the angry eagerness for them, and the disappointment of those who have not received them. Another correspondent, signing "A Curious Exhibitor," asks a number of questions as to the motives of the protesting gentlemen, which we really cannot answer, and which are so uncomplimentary to the said protesters that we cannot print them. One gentleman, probably the ablest landscape photographer in England, writes: "I feel very sorry that so much bad feeling and bad taste have been displayed by various parties in connection with these medals. You must feel annoyed as well as the whole of the other jurors at the absurd exhibition of ill feeling shown by disappointed exhibitors. But perhaps you did not expect to please everybody." Of course we did not. That would have been impossible. There must inevitably, in all contests, be some disappointed competitors, and generally many who protest. It was so in the Great Exhibition of 1862, and, in fact, in every exhibition of which we have known anything. But we make many allowances for persons in the first impulse of disappointment, and are less concerned about the matter than our correspondent imagines. Another correspondent, signing "Captain Bobadil," sends us a letter introduced by a long account of his famous achievements and great wisdom, referring to his friend Major Longbow as voucher for his accuracy. We find room for part of his letter, which consists chiefly in an emphatic protest against everything connected with the North London Exhibition. He says:—"I protest especially against the offer of medals as repressive of competition. I protest against the award of medals to the announced recipients. I protest still more against withholding the award in some instances. I protest against the jurors as incompetent and prejudiced: being men of much experience in photography, how could they know anything of photographs or of the apparatus with which photographs are taken? Being men unconnected with photography commercially, how could they be supposed to be free from trade bias? I protest against their method of using their own judgment in making their awards, instead of adopting that of each competitor. In cameras, for instance, why did they not consult the workmen or their apprentices, who must know something about cabinet work, and therefore be competent to give an opinion on the requirements of the photographer. I agree with my friend Rejlander, whom I am proud to see 'in type,' that instantaneous photography is only sleight-of-hand. I agree with him in believing that Mr. Blanchard would have liked the medal for the most artistic photograph, and I protest, therefore, against the jurors not giving him that medal, whether they thought his pictures most artistic or not. I affirm, moreover, that with my friend Rejlander and others, I think my judgment is better than that of any number of jurors, that my contributions were the best exhibited, and that I am the proper judge of their merits. I protest against the jurors relying upon their judgment and experience in making their award to lenses, when it would only have required about six months to test properly all the lenses exhibited. * * * Finally, I beg to suggest that the whole proceedings be quashed, and the matter be placed in my hand for re-adjustment, and I pledge myself that if the result does not please everybody, it will at least please, yours to command,—Captain Bobadil." Surely everybody ought to be satisfied with such an offer as this.

Kent.—Your description of your collodio-chloride prints as "misty and hazy," is not sufficiently definite to enable us to offer an opinion as to the cause. If, as you suppose, it arises from imperfect contact between the opal glass and the negative, the result would be want of sharpness, which is a fault very easily seen. The iredescent result of some of your prints may arise either from the use of an unsuitable sample of collodion, or from the use of damp and dirty plates. The hypo fixing solution may consist of one ounce of hypo in ten ounces of water, in which the print may remain for ten minutes or a quarter of an hour.

Periwinkle.—Experience alone will give you skill in the manipulations with the solar camera. Information will aid you, but it can never be a substitute for the experience and practice by which skill is obtained. You seem to have overlooked the fact that Mr. Woodhury's mode of development is for application to prints which are exposed wet. Stains can only be avoided by skilful manipulation. The absence of half-tone is either the result of under-exposure or an unsuitable negative. Printing out requires a very long exposure in this country, but it involves less risk and other imperfections. Doubtless it would be of great advantage to you to receive some practical lessons in the mode of manipulating; but we do not know of any one who undertakes tuition in that branch.

F. Downer.—Received; and shall have attention.

Lux et Salus.—Thanks for the fine prints. We shall be glad to hear further from you.

E. Murray writes to say, in allusion to the statement that he planted his camera in a window of the police court at Ramsgate for the purpose of photographing the murderer Southey, that his camera was placed in front of the magistrate's bench by permission of the Chairman, Mr. Crofton, and not by toleration of the police. The statement of the matter in reference to the window was given in the daily papers. In regard to the attempt to secure murderers' portraits in such a matter, of course every photographer has a right to adopt the course which seems to him right, and doubtless the profit is a great temptation in such matters; but we cannot help regretting that photography should be thus used to pander to a morbid taste even in a legitimate manner, and still more must we, for the credit of the art, protest against a surreptitious attempt to secure the portrait of any man, which it must be distinctly borne in mind is a thing in which he alone possesses an absolute property.

Un de la France.—We cannot give you any reason why you failed to secure further intensity when you employed the solution of iron and citric acid, described in our Year-Book. We have frequently used it with success, and we know many others who do so. Did you forget to add a few drops of nitrate of silver? Try reducing the proportion of citric acid.

Simplex.—You will find some useful information on enlarging negatives in our last Year-Book. Should you find any difficulty, state in detail its nature, and we will aid you. 2. There is no absolute remedy for collodion which gives a reticulated film. It proceeds from the presence of too much water in the collodion, and this is a defect not easy to remove. You may reduce it to a minimum by allowing the film to set well before immersion in the bath. Your cards are very good, especially the groups. The pose in No. I is a little stiff.

J. Vaughan.—Prints generally tone more rapidly which have been only slightly washed; but the facility in toning is obtained at an unnecessary expense of silver and gold, as the silver is lost, which might have been easily recovered from the washing water, and the toning bath is frequently decomposed by the immersion of unwashed prints.

J. S. Anderson.—A dipper made of horn would probably injure the nitrate bath, and would certainly reduce the silver upon its own surface. A good coat of lac varnish might protect it, but this soon gets scratched off. A glass dipper may be made just as easily and more cheaply by cementing with marine glue a small bar of glass on to a strip of the required size.

F. N. states that he finds the new iron developer with gelatine answers admirably, but that in some cases, after drying, the film splits. We have not heard of any such defect following the use of this developer, nor do we see how it can arise from such a cause. Have any of our correspondents met with this? We fancy that the defect must arise from some of the ordinary causes of splitting, and not from the developer.

Onward describes a new lens he has made. He says:—"The lenses are 4½ inches in diameter; the focus, measured from the back-lens, is 6¼ inches; and the combined focus, 8 inches. There is no fixed central stop, and it works well with the full aperture. I enclose you two portraits of a person placed at only five feet from the lens. One was taken with a full aperture, the other with a two-inch stop. One unexpected peculiarity is the great depth of definition obtained without loss of sharpness. In the portrait taken with the full aperture, the definition is equally good, from the eyes to the back-hair. It has often been said that a large aperture must necessarily give distortion; but I think, in choosing between these two portraits, most persons would prefer that taken without a stop." We cannot agree with "Onward" as to the superiority of that taken without a stop. It possesses just the characteristics we should have expected, namely, an entire absence of focus, the result of considerable positive spherical aberration. This in a large head, where diffusion of definition is required, and extreme sharpness not necessarily imperative, may be permitted, but it would be quite intolerable in a small picture. In such case, moreover, there is a necessary loss of rapidity. Large vignette-heads are the worst possible tests of the quality of a lens, but that with the two-inch stop is, in our estimation, much the best. We shall be glad to see a standing full-length male figure on a card-size, or on a quarter-plate, with the full aperture, and with a stop. We can then judge much better of several qualities in such a lens.

H. L. P.—We find that the new developer gives decidedly more intensity than the ordinary iron developer. The sample we made a few weeks ago, and described, has become browner in colour, and somewhat less energetic in action. 2. You will see some remarks about the medals in another column. You are assuming too much; they are not photographers who have protested, but manufacturers of tools for photographers. It is very probable that some photographers are disappointed, but have the grace to accept an adverse decision in silence, instead of modestly proclaiming their own conviction of their superior merits.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

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OBERNETTER'S ENAMEL PROCESS.

One of the most beautiful applications of photography which has been made, and the only one in which the image is not only permanent, but also within certain limits indestructible, is the process of producing photographs in enamel or vitreous colours. A carbon print is doubtless permanent, but the paper on which it is produced is very liable to injury, and it has been asserted by some that wherever organic substances like gelatine are used as the vehicle for the carbon, and the means of attaching it to the paper, an element of decay is at once introduced. We are not about to discuss that question at present. We merely mention it in order to point out that in the enamel photograph all these possible elements of change and decay are eliminated. The image is produced in an enamel colour on a tablet of enamelled copper, and burnt in or vitrified; the picture then being invulnerable to any injurious agency short of a violent destruction of the whole tablet. The permanency of the picture is unquestionable, and in some instances its beauty is unapproachable.

It has often been to us a matter of some surprise that so little attention had been given to the subject amongst photographers in this country. With the exception of the process of M. Joubert, which, until recently, was applied chiefly to transparencies, and devoted more especially to decorative work, there has been no practical enamelling process worked in this country. Eight or ten years ago, Mr. Burnett published some excellent hints on the subject, and one or two processes were even patented; there have been also, from time to time, a few experiments by Mr. Tunny, Mr. Barnes, and some others; but no practical or commercially successful process has issued from these experiments. The exquisitely beautiful specimens of Lafon de Camarsac have appeared, from time to time, in our exhibitions, and have received unbounded admiration. M. Camarsac has, moreover, established an agency in this country, negatives taken here being forwarded to Paris, where enamel prints are produced therefrom. The process used by M. Camarsac has been kept secret, a vague general impression prevailing that the action of light on either perchloride of iron or bichromate of potash and gelatine was made available in obtaining a vehicle for securing an image in a vitreous colour. As it was observed that the prints were frequently slightly reduced in size from that of the original negative, it was concluded that the image was produced in the camera. It is more probable, however, that this arises from the necessity of obtaining a transparent positive as a *cliché*, and this transparent positive being obtained in the camera accounts for the variation in size. We have heard, from time to time, of enamel processes being successfully practised in Germany, but still no details of the methods employed obtained publicity.

At length we learn something more on the subject; but in doing so we learn little that is new. We merely find that very fine results are produced by well-known and apparently inadequate means. At one of the soirées held in Birmingham by the British Association, a number of very fine small enamel portraits were exhibited, very nearly resembling in general effect those of M. Camarsac. These were described as by Obernetter's process, and Mr. Dale, a member of the firm who has purchased the English patent, who was in attendance, courteously gave us a brief description of the process, and also of M. Obernetter's statement of the theory on which the process was based. It struck us, however, that the latter was not in harmony with what is known of the action of the materials employed, and, further, that both in principle and detail, the process seemed singularly like that already patented by M. Joubert. We concluded, however, that some misunderstanding of the matter probably arose from the hasty sketch being given in a crowded soirée. Since then we have examined the unpublished specification, at the Patent Office, and find that the method and the theory offered are substantially as we understood Mr. Dale to describe them.

The specification is entered by Mr. Martins; the process, which is described as a communication from M. Obernetter, is as follows:—

Take of Gum (arabic, we presume)	...	5 parts
Sugar	...	15 „
Glycerine	...	5 „
Bichromate of ammonia	...	6 „
Water	...	100 „

These must be mixed, dissolved, and kept in the dark, of course. A plate of glass is then coated with the solution in the same manner as a plate is coated with collodion; it is then dried in the dark at a temperature of from 90° to 130° Fah. When dry the plate is exposed under a transparent positive, a slight image being visible when the plate has been exposed long enough. No absolute guide for exposure can be given, but the time is stated to be about the same as that employed in ordinary paper printing.

When the picture is removed from the pressure-frame, the following powder is applied with a brush:—

Porcelain colour and flux	...	100 parts
Dry powdered soap ...	...	1 part.

The nature of the "porcelain colour," or its flux, is not stated, but we presume any suitable vitreous colours may be employed. Neither is the kind of soap specified, the statement being vague and general; but we are by no means sure that this is of any consequence. The application of the vitreous powder is to be continued until sufficien density or depth of colour is obtained. It is at this stage the theory is put forward, but rather as a supposition than as a statement of fact. It is suggested that when the mixed powder comes into contact with the parts of the coated plate which have been protected from light a decomposition ensues; "the chromic acid decomposes the soap in such a manner that the fat is liberated, the alkali combining with the chromic acid. The fat thus liberated enables the colour and flux to adhere, and destroys the injurious effect of the chromic acid." Now this statement of theory strikes us as a singular instance of searching far for an abstruse reason when a simple one is found close at hand. The hitherto well understood mode of action in such cases as that described is simply this:—the preparation with which the plate is coated is naturally hygrometric and sticky; but in those parts upon which light acts this quality is destroyed, and the preparation ceases not only to be sticky, but becomes insoluble. Those parts protected from light by the dense portions of the *cliché*, which are really the blacks of the picture, retain their hygrometric properties, and the vitreous powder when applied to them readily adheres without the aid of any fat. This is the principle upon which M. Joubert's process is based. We cannot undertake to say that a decomposition might not take place if some kinds of soap were brought into contact with the chromated film; but we apprehend, if the colour depends for adhesion on the presence of the fat in one part of the soap powder in one hundred parts of vitreous colour, the result would be very doubtful. As, however, it naturally adheres to the sticky surface, and the practical result is obtained, it is not necessary further to dwell upon the theory.

The picture in its proper intensity having been obtained, it is now necessary to transfer it from the plate of glass to the surface upon which it has to be enamelled. To effect this the proceeding is as follows:—The picture is coated with plain collodion, and then dried. It is then immersed in water made slightly alkaline, which removes the collodion film, bringing with it the picture, which is washed by carefully and alternately dipping it in water, and withdrawing it. It is now attached to the ceramic surface by means of a solution of gelatine, the collodion uppermost, in order that it may be removed by dissolving with ether and alcohol. It is then placed in the muffle, and fired in the usual way. The points claimed in the patent are, first, the combined processes described; and, second, the use of porcelain colours combined with soap or other such material for producing a picture upon a surface prepared with a substance which will decompose the same.

Now, with the exception of the soap and the theory based thereon, which, so far as we can see at present, are useless, this process appears to us to be identical with that patented by M. Joubert some years ago. We may possibly do M. Obernetter some injustice in our view of the inutility of the soap, and the error of the theory based thereon. Some unexplained principle may be involved and some advantage gained which we do not see, in which case we shall be glad to be set right. But so far as we can see, the process, less these elements, is the same as M. Joubert's, which effects his purpose without these agents. M. Joubert makes use of a saturated solution of bichromate of ammonia, five parts, and of albumen and honey each three parts, and adds to these from twenty to thirty parts of distilled water; coats a glass plate, dries, exposes under a transparent positive, applies an enamel powder to the protected parts which remain sticky, and to which the colour adheres, and, after certain washings, places the picture in the muffle and fires it in the usual way. The operations, it will be seen, are nearly identical.

It is to be admitted, however, that the results, so far as we have seen them, are somewhat different. M. Joubert has, as we have said, chiefly worked for decorative purposes, producing transparencies suitable for ornamental windows, &c. The examples of Obernetter's process exhibited at Birmingham were chiefly small portraits of great delicacy, resembling those of Camarsac. We have seen a few of M. Joubert's possessing similar qualities, and it is possible that his attention having been given chiefly to another class of pictures is the sole reason that more of the delicate portraits to which we have referred have not been produced. It is difficult to form a correct comparative estimate without having the pictures before us for careful examination; but the impression we have derived from incidental inspection of each is that Camarsac's and Obernetter's excel in delicacy, Joubert's in vigour. Whether this is due to the materials, manipulation, or the intention we cannot say; but looking at the general similarity of the methods of the two latter gentlemen, we can see no reason why similar results should not be produced by each.

There is another and significant point to be mentioned in connection with this subject. Both the process of M. Joubert and that of M. Obernetter yield pictures with perfect gradation of half-tone, although the method by which they are produced seems, according to the experience derived from working carbon processes of a similar character, inimical to the rendering of half-tone. It has been recognized in carbon printing with organic matter and a bichromate, that half-tone can only be obtained by exposing one side of a film and washing away unaltered material at the other; that gradation is dependent rather upon different thicknesses of organic matter left quite insoluble; that, in short, the action of light does not produce entire insolubility in some places, and partial insolubility in others; but that wherever light acts it leaves a layer of perfectly insoluble organic matter, the only difference between intense action of light and a slight action of light being found in the thickness of the layer rendered insoluble. But in these processes the contrary seems to be the fact. The ceramic colour is applied to that surface which has been in contact with the cliché, and yet it adheres in perfect gradation, registering the exact amount of the action of light by the extent to which it adheres. The portions entirely protected retain altogether their sticky character, and the colouring matter adheres in sufficient body to produce deep blacks. Where light, passing through a less dense portion of the negative, has acted but very slightly, it adheres in less degree, producing merely deep greys, and so in definite proportion to the action of light through the different gradations of density in the negative. It seems late in the day to suggest the possibility of producing good carbon prints by a similar method, seeing that in many of the early experiments in carbon printing a similar plan was really adopted, with but indifferent success. Nevertheless, from *à priori* reasoning, it would be natural to conclude that the process which gives satisfactory gradation with ceramic colours for burning-in should do so with carbon or other colouring matter in impalpable powder. It is true that in such a process the transparency due to the vitrifying of the colour, an essential element in satisfactory pictorial effect, is wanting. But there is another fact bearing on this subject, which is worth mentioning. In the Exhibition of 1862, if we remember rightly, there were some very charming carbon prints exhibited by M. Camarsac, which had all the delicacy and general characteristics which distinguished his enamels, suggesting that both were produced by a similar method. It may probably be just worth the trouble for those engaged in this class of experiments again to try the enamelling process above described for producing prints in carbon on paper. If success could be obtained, an immense power is gained in examining the process of printing, and controlling the depth and general character of the prints.

Meanwhile it may be important to those concerned, to ascertain how far the enamelling process just patented is an infringement of that of M. Joubert. If either process, or a modification, could be rendered available on paper, we apprehend that no patent claims would interfere with its practice.

Since the above article was written we have received a most interesting article on carbon printing from M. Carey

Lea, which we recommend for the careful perusal of all interested in this line of experiment, as full of valuable hints and information. The valuable property of the neutral chromate of potash and ammonia, of remaining in contact with organic matter without becoming spontaneously insoluble, a defect so common with the ordinary bichromates of potash or ammonia, is of incalculable importance in facilitating satisfactory results.

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NORTH LONDON PHOTOGRAPHIC EXHIBITION.

Landscapes.

The display of landscapes at this exhibition includes some of the finest examples of this branch of the art we have seen. When we mention the names of Mudd, Bedford, and England, it will be readily understood that the pictures are good, and we may add that the contributions are amongst the finest we have ever seen them exhibit. The fine Alpine scenery of Mr. England, which struck us in a more dimly-lighted room as rather heavy from deep printing, appear in this well-lighted gallery to perfect advantage, and leave nothing to be desired. The admirable landscapes of Mr. Bedford, so delicate and full of atmosphere, possess more of the prevailing character of brightness and perfect lighting than almost any photographs we see. Mr. Mudd's pictures are perhaps the most poetical of all the landscapes exhibited. There is that indescribable presence of feeling in them that enchains the beholder's attention with a loving regard, and makes him long to visit the lovely and peaceful scenes of nature portrayed. The transparent shadows in the placid lake, the stirless repose of the distant foliage, the calm, peaceful effect of many of the landscapes, seem to woo the pent-up city worker to the glad rest they afford. And in all the pictures he exhibits, both in the bold grandeur of the larger photographs and the more delicate beauty of the cabinet pictures, there is manifest such a careful study of composition and mastery of the subject, that we feel very little doubt that had the medal been awarded for the most artistic picture, and Mr. Mudd had not received one for the best dry plate pictures, the artistic medal would have been his.

In alluding to the highest art excellence we are naturally reminded of the instantaneous stereographs of Mr. V. Blanchard. In referring to this subject the award of the jurors of a medal for instantaneous pictures has been the subject of some singular criticisms by persons who ought to have known better. The award has been regarded as a tribute to dexterity, sleight-of-hand, quick working—anything, in short, except that which it really is, namely the exercise in the highest degree of almost all the qualities which go to make a good photographer. The criticisms to which we refer strikingly illustrate the tendency in some minds to underrate that which they cannot achieve or which they have never attempted, and the difficulties of which they hence do not appreciate. Of course there are grades of excellence in instantaneous pictures, but to attain the highest success in securing them requires, in the first place, a cultivated taste and knowledge of what is good, and a rapid power of perceiving and appreciating natural beauties; it requires a perfect command over all the technicalities of the art, so as to be able to secure at all times the best chemical conditions, the most exalted sensitiveness, and the most perfect cleanliness. Rapid, skilful, and certain manipulation constitute the lowest qualification for success, although to some minds it appears to be the only ground of superiority. Fine instantaneous pictures can only take second rank on artistic grounds simply because they afford less scope for deliberative art contrivance, arrangement, or composition than some other classes of pictures; but they require not the less a thorough knowledge of these things, and a perception of the existence of good composition in natural objects, and a power of selection, and, at times, of arrangement. The stereographs exhibited by Mr. Blanchard admirably illustrate all this. They include some of the most exquisite effects of cloud scenery we have ever witnessed, and the arrangement of sea, foreground, and marine objects, with which they are found in combination, illustrate Mr. Blanchard's fine eye for good composition in nature when it is to be found. They are pictures of which we never tire, always affording fresh pleasure in the contemplation; and we rarely examine them without longing to see some of them enlarged.

Mr. Nelson K. Cherrill exhibits a frame containing landscapes, interiors with machinery, and some magnificent examples of the large, massive waggon-horse. These horses, taken in direct sunlight, apparently instantaneously, are exceedingly fine and perfect. The interiors are amongst the finest examples of this kind of work we have seen; delicate, well-defined in all parts of the complex machinery, free from curved lines or distortion, they are altogether excellent. The landscapes are also fine, especially considered as studies of foliage, for which purpose they are exhibited. Mr. J. C. Leake has some fine vignetted landscapes taken in Epping Forest; these are very delicate, but wanting a little in contrast, the monotony being due apparently to the absence of sunlight. Mr. Morley has some very good landscapes from dry plates. Some views in the English lakes are exceedingly good; some of the prints exhibited here, however (a common fault of dry plates), being a little hard. Mr. Ernest Edwards exhibits a series of views about Cambridge, having great delicacy. Mr. Goslett has a series of good landscapes by the milk process, which illustrate the fact that a very simple and excellent preservative is to be found in milk.

Mr. Frank Good exhibits a series of landscapes, many of which are of well-known scenes in the Isle of Wight. Mr. Good is rapidly progressing into the position of one of our very best landscape photographers: he has a fine appreciation of artistic effect, and works with great delicacy and care. There is a little too much formal arrangement apparent in some of his groups. This is a fault which a little thought and practice will enable him to avoid. Altogether he contributes a charming series of pictures. Mr. W. W. King sends some fine interiors and exteriors of churches, some by the tannin process and some by collodio-albumen, both processes receiving full justice at his hands. Mr. King, as many of our readers know, is an ardent archæologist, and the skill and care with which he has photographed some of the old churches, to visit which his favourite study had led him, illustrate the spirit in which he combines the two arts which he has often urged our readers to study in conjunction with each other. Mr. Ross exhibits a series of interiors of the Crystal Palace, to illustrate the working of his new doublet lens. The pictures are in all respects excellent, and are admirable examples of the work which they are exhibited to illustrate. Mr. Braun exhibits a couple of panoramic views of Swiss scenery, being the largest pictures we have ever seen executed by the pantoscopic camera. They are alike admirable as photographs and pictures, and very valuable illustrations of the beauty a landscape acquires when it includes a wide angle, which, under other circumstances, might be commonplace and uninteresting.

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CARBON DIRECT PRINTING.

BY M. CAREY LEA.

The term "carbon direct printing" is applied to that species of carbon printing in which the negative is applied directly to the prepared surface, and, after exposure, the parts not hardened by the sun are washed out with water. The characteristics of this process are: 1st, that a non-reversed positive is obtained; 2nd, that no transferring is necessary; 3rd, that the half-tones, when the negative is not made up of black and white only, are, to a great extent, undermined and washed out.

I have felt a good deal interested in this process. Like the other carbon processes, or some of them, it has the great merit of unquestionable permanence. Moreover, it is extremely easy of execution. And, as I have already pointed out, when the proper chromate solution is used, the paper keeps extremely well. In the only case in which I have chanced to keep this paper over a month, it was still in excellent order when tried, and it is even possible that it might be kept for a still longer period without losing its sensibility. On the other hand, this method is, in my opinion, only adapted for copying in those cases where no half-tones are needed. There are certain departments of photography for which it is well suited, viz., for the reproduction of maps, plans, and certain sorts of drawings. Line engravings may be copied by this process when the scale is not too much reduced from the original. In this latter case, however, the exposure must be very correctly timed.

But little has been published on this process. My proportions and manipulations were worked out by myself, and may perhaps be interesting to some who may desire occasionally to work in this field.

The substance whose effects most interested me in this connection was albumen. At the time I first tried it (now several years since) its use had not, I think, been suggested for this work, though it has been since. But I do not think its peculiar function in the process has been clearly recognized.

Its use is to keep the whites clean. If we make a mixture of bichromate, carbon, and gum, or gelatine, apply it to paper, expose and wash it off, we shall get a picture of which the whites cannot be perfectly cleared, but obstinately retain a portion of the carbon. If we add a quantity of albumen to the mixture, we shall find that the whole picture (unless greatly over-exposed) washes off; but if we employ it in the proper quantity, it will give us perfectly pure whites, while the picture itself remains perfectly solid. Thus albumen is perfectly invaluable for this sort of printing. For obtaining the best results it is indispensable.

Gum and gelatine are often spoken of as if they might be used indifferently; but there is a wide difference in their action. Gelatine is soluble in warm water, insoluble in cold; gum easily soluble in either, and prints in which gum is used must therefore be developed with strictly cold water, gelatine prints with hot. The action of bichromate, under the influence of the sun, is much more rapid on gelatine than on gum. Paper prepared with gum must be exposed, all other things being equal, about three times as long as in the case of gelatine.

This greater sensibility of gelatine would be a marked advantage, were it not that the exposure is in all cases so short that the difference of time between the two loses all real importance.

Gum, on the other hand, has one very decided advantage—that its solutions do not gelatinize by cooling; consequently, mixtures in which it forms a part can be extended over paper with much more facility than when gelatine is used. The latter substance thickens on the brush, and becomes suddenly lumpy on the paper, in consequence of this gelatinization, whereby the difficulty of obtaining smooth and even sheets is materially increased. The development with cold water also has its advantage. It is often best after softening the sheet, and washing out the soluble salt, to develop under a stream of water from the tap. If warm water is used, it is not always easy to regulate the temperature of the stream which issues from the tap, without special arrangements.

I.—Sensitizing the Paper.

The sensitizing salt which I prefer is the neutral chromate of potash and ammonia. I prepare it as follows:—Take a cold saturated solution of bichromate of potash, I add liquid ammonia to it until it turns red litmus paper faintly blue. The quantity necessarily is very small. If, by mistake, too much has been added, of course more of the cold saturated solution of bichromate should be added until the ammonia remains in very slight excess only.

This neutralized solution keeps very well. It is not necessary to evaporate it, nor to crystallize it. Paper prepared with it is sufficiently sensitive, and keeps ten or fifteen times as long as when simple bichromate of potash is used.

For preparing small quantities of paper at a time it is convenient to use the gum in fine powder. But in this form it is extremely liable to be adulterated, and should only be purchased from a dealer in whom thorough confidence can be felt.

The proportions to be used are as follows:—

Solution of double chromate potash and ammonia, prepared as above ...	15 parts
Pure powdered gum arabic	8 ,,
Dust of graphite	1 to 2 ,,
Albumen	2 ,,
Glycerine	1 part

The best way to obtain a smooth mixture is as follows:—Warm the solution; put the gum and the graphite into a porcelain mortar; add the solution of chromates by degrees, mixing it thoroughly with the pestle; finally, add the albumen and glycerine. A sort of lumpiness is apt to be produced at first, by portions of gum becoming encased in a thick syrup of dissolved gum, which excludes the liquid from penetrating. If convenient, it is a good plan after mixture to let the whole stand for an hour or two, and then to mix again.

The object in using glycerine is to impart the necessary flexibility to the paper, which is otherwise hard and stiff, does not lie close to the negative, and risks scratching it. Too much, however, is to be avoided; it renders the paper incapable of thorough drying, and leaves it sticky and worthless. The proportion given in the formula will be found to yield good results.

For a carbon pigment, I prefer *graphite*. There is a sort sold for applying to surfaces to be electrotyped, in order to give them conducting power, which consists of plumbago in a state of extremely fine division. It is said to be that which gathers on the beams and rafters of the mills in which black-lead is ground, and therefore consists of the impalpably fine portions which float away on the air. Although it has a greyish appearance in the powder, it prints dark black, and works cleaner than lamp-black or any other form of carbon.

The mixture when made should have almost the thickness of honey, and is to be spread over paper with a broad, soft, clean, camel's hair brush. A mistake which every one will make on first trying the work, will be that of putting on the colour too thick. The experimenter naturally reflects that the darkest portions of his finished picture can be no blacker than the colour which he is then applying, and he therefore conceives it necessary to bring his paper up to a full, dead black. This is altogether a mistake, and the eye is completely deceived in comparing the effect of thin lines and markings with broad surfaces of colour. It is not easy to give an idea of the proper thickness of the coating. Some notion may be had from this: it should not look dead black, but greenish black, the colour of the bichromate being distinctly visible through it, and not masked by the intensities of the black pigment. If brushed over printed letter paper, the lines of the printing should be clearly distinguishable through the black coating.

Another indication of good work is this, that the paper shall have a high gloss when dry. This characteristic has never before been mentioned. When it is absent, when the paper has a matt or dead look, it is a clear proof of one or other of two things,—either the gum has been used in insufficient quantity, or else it has been of bad quality. The paper should be rejected. Really good results cannot be attained upon it.

Well-prepared paper has the following characteristics:—It is smooth, and neither spotty nor streaky; it is at least as pliant and flexible as before the mixture was applied; it has no stickiness, does not adhere in the least when a dry finger is applied; it has a dark olive, and not a black shade.

If the dry paper has not these characteristics, it is hardly worth while to waste time in printing it, but it is better to begin afresh. All these indications, however, are not of equal importance. Paper that is a little spotty will sometimes answer pretty well, at least in those cases where the work is new, and there are no broad masses of deep shade. I enclose a vignette executed by this process.* The deep mass around the female figure indicates what I mean in this respect, and such work requires good, smoothly-prepared paper, on which they are printed.

II.—Exposure.

It has been much complained of, with respect to most of the carbon processes, that the photographer is left in doubt as to whether the picture has been sufficiently exposed or not. If that charge were extended to this particular method, nothing would be more unfounded; there exists a criterion which can always be depended upon.

The absorbent nature of paper always carries a portion of the bichromate or neutral chromate solution into it; the paper becomes yellowish at the back. When the print has been long enough exposed, the action of the light penetrates the paper, and all the boldest parts of the picture become *visible on the back*. A little experience is needful, of course, to enable the experimenter to recognize just how much of the picture should thus become apparent, but the same is true of all photographic processes whatever. Nor are the indications in this case more difficult to seize than in other descriptions of photographic work. A little over-printing may be remedied by longer development, but under-printing is fatal; the picture disappears before the soluble chromates can be washed out of the paper.

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* The print enclosed is an excellent example of reproduction; vigorous, clean, and of a good colour.—Ed.

It is not easy to speak definitely as to the time necessary for exposure, so much depends upon the amount of colour which has been placed upon the paper. It is evidently necessary that the effect of the light should penetrate the centre layer and reach the paper. The time requisite for this necessarily depends upon the thickness of that layer. With a layer no thicker than is really proper the exposure is about one half, or rather less, than that requisite with the same negative for printing on chloride paper. As the layer increases in thickness so does the time of exposure increase; and when a certain point is reached, it becomes impossible for the fine lines (for example, in the reproduction of a line engraving) to pierce through the layer.

III.—Development.

The means proper for the removal of the pigment from the lights will depend entirely upon the quantity of the albumen placed in the mixture. If very little has been added, and, still more, if none at all, the proofs, after lying some time in water, will require to be smartly brushed with a broad, flat, soft camel's hair brush.

If rather more albumen has been used, the prints, after soaking sufficiently in running water to remove the soluble chromates (about ten minutes, or till all yellowness has completely disappeared), may be held in the direct stream of water issuing from the tap, which will be sufficient to clean them, without the application of a brush or other friction.

If a full proportion of albumen has been used, the prints, by lying in water, will *clean themselves*; it must need only to be held for a moment in a very slow and gentle stream of water.

The advantages of being able to use this latter plan are decided. Where the unexposed parts can only be got off by the use of the brush, no matter how much care is taken, the very fine lines (for example, the hair lines in a fine steel plate) almost inevitably suffer; whereas, when the development takes place by the mere solvent action of water, these last are better preserved, and the general effect is better.

But when albumen has been liberally used, the operator must not employ the brush, even where the picture does not seem disposed to clean itself, but must depend upon continued soaking and the mechanical effect of a gentle stream of water. Prints which require a soaking of an hour or two may in the end turn out the best.

If, however, too much albumen has been used, the sensibility of the layer is materially impaired, a prolonged exposure becomes necessary, and even then, parts of the picture may attach themselves in the developing.

The same effects result if the sensitive mixture be spread upon albumenized paper. So far from any benefit resulting from this, the layer of albumen is fatal to obtain a good result.

IV.—Remarks on the Choice of Paper.

Almost any paper may be used in this process. I have tried every variety. Even on ordinary good letter-paper I have obtained good results; so also on photographic paper, sold as such, and on the very hard paper known as bank-note paper. Unsized paper is altogether unsuitable. Generally speaking, the harder sized the paper is the better. One great advantage in hard paper is, that it keeps the chromate more on the surface. Paper of spongy texture, even when made up to show a good surface, and paper filled up with earthy matter, soak in too much of the sensitizing salt, from which a double evil results. First, its removal from the pigmented gelatine diminishes the sensibility of the latter; and, secondly, when thus diffused through the paper, it is harder to wash out, and the picture may become thoroughly developed, while the paper is still charged with more or less chromate. Then the picture must either be preserved with the whites, and yellowish and unsatisfactory, or a longer soaking must be tried, which may destroy the print. The remedy is, of course, a longer exposure; but such paper should be avoided.

Another cause which leads to too great an absorption by the paper is the use of too thin a mixture. Where this is the case, it must be thickened by increasing the proportion of gum.

V.—Selection of Pigments.

I have already mentioned that among black pigment I decidedly prefer graphite, though very fine lamp-black may undoubtedly be used with good effect.

Where it is intended to use colours, either alone or for mixing with the black, it is, of course, necessary that the pigment should not be liable to be destroyed by the bichromate, which powerfully attacks many substances used as colouring matters. The following I have tried, and find suitable:—

Blue—Prussian blue is entirely unaffected by the chromates and bichromates.

Green—The so-called "chrome green" resists the action of the bichromate perfectly. The true chrome green, which consists of green oxide of chromium, is far more permanent in many respects; but as to resistance to the chrome salt, the common chrome green leaves nothing to be desired.

Red—Specimens of carmine which I have tried were destroyed. There is a fine red sold as "French Scarlet Lake," which resists the bichromate perfectly. So does aniline red, or rosaniline.

Purple—Mauve resists well, but acquires a brownish hue from the brown oxide of chromium produced by the action of light in the exposure under the negative. Both the aniline colours have this disadvantage, that they tinge the whites and cannot be washed out clean. This is a serious objection, whether they are to be used alone or to tone the black.

Brown—The ochres resist well. There is a fine sort sold as "golden ochre," which gives the best results.

Yellow—Chrome yellow, of course, resists well; but a yellow picture on white paper is almost invisible. If used, it should be deepened with golden ochre.

Colours can, however, rarely be required. The propriety of mixing them with the black is doubtful. Greater permanency cannot be expected from them, when used in this way, than they possess under ordinary circumstances. The advantages which this process possesses are its facility and its undoubted permanency; and, although the admixture of coloured pigment cannot affect the permanency of the carbon, still it must be remembered that it may possibly pass to a shade such as would make its presence a disadvantage instead of a benefit.

In studying this particular process, I had some special objects in view which led me to make extended experiments with various coloured pigments, and a part of the information so gained seemed worthy of recording.

There is another point worthy of notice in connection with the use of pigments.

The colour of the reduced chrome salt always tends to show itself through the pigment. This colour is at first brownish, depending upon the presence of the brown oxide of chromium, considered by Storer to be a chromate of chromium, Cr_2O_3, CrO_3, a salt of sesquioxide of chromium and chromic acid. This undergoes a farther reduction, and, with time, becomes completely reduced to sesquioxide, Cr_2O_3. The colour of the pigment becomes thus modified by the addition of a little olive, which naturally takes from its purity of tone. It is therefore desirable, when pigments are used without black, to reduce the quantity of the chromic sensitizer to one half, or less, by diluting it with water, and making up for this by extending a little the exposure. Even a black pigment is sometimes a little affected by this cause, and the addition of a little scarlet lake forms an agreeable corrective.

I have already mentioned that the use of the neutral chromate of potash and ammonia imparts greatly improved keeping properties to the paper, without, at the same time, rendering it objectionably insensitive. We must here make a distinction which differs somewhat from anything observable with chloride paper. Bichromate of potash, when in contact with organic matter, is liable to act upon it either spontaneously or by the effect of light. With the neutral chromate of potash and ammonia the first of these tendencies disappears, either altogether or almost altogether, and the direct agency of light is requisite. But the sensibility to the agency of light remains very great. And this is evidenced in the following manner:—If paper prepared with chromate of potash and ammonia be kept in a drawer which is not perfectly close from light for several days, the salt which was soaked through to the back of the paper may be affected by it, a scarcely perceptible deepening of colour takes place, and it becomes hard to wash out the yellowness of the paper, so that, unless the picture is decidedly overprinted, it washes off before the paper can be rendered thoroughly white. At the same time, the sensitive layer may not be the least affected, but may wash off from the unexposed parts just as clean, as respects the pigment, as it would have done the first hour it was prepared. Here is *great sensibility to light without tendency to spontaneous decomposition.*

On the other hand, paper prepared with bichromate of potash, and kept absolutely protected from all influence of light, undergoes a change which may take place in a very few days, or even hours, by which the whole layer becomes altered so completely that, if thrown into water without any preliminary exposure, it refuses to wash off. Here is a *tendency to rapid spontaneous decomposition without the agency of light.* I have even seen this decomposition take place under the following circumstances:—The papers were prepared at night with all due care, were dried without heat, rolled up in a small tight roll, placed in a tight tin cylinder, and this placed in a dark drawer; yet in twenty-four hours the sensitive layer had become totally insoluble.

It is to be regretted that in this operation it should be desirable to apply so thin a pigment coating to the paper, for it is much more difficult to do it well. A thick coat of colour is easily put on smoothly and well, but difficulty is greatly enhanced when the condition of thinness is imposed. Still, with a little care and practice, it can be accomplished.

In the operations which I have described, gum is more convenient to use than gelatine, for reasons already sufficiently explained. But should work of this sort be found to admit of regular practical applications for reproducing maps, plans, diagrams, &c., paper might be prepared and sold with the pigment gelatine, and sensitized, when wanted, by a bath of double chromate. This could not be done with gum, owing to its solubility in cold water.

One object which I have in publishing the foregoing process is the following. There is nothing which I so much wish to see accomplished in photography as the discovery of a really practicable carbon process without transferring, and which shall include the perfect preservation of half-tints. Several persons already claim to have accomplished this, but the processes which they employ are kept secret, and it is scarcely possible to judge of their real value. I think, therefore, that it is desirable that all information with regard to carbon processes should be made as public as possible, in order that each experimenter may have all the existing knowledge as his basis upon which to build further. The foregoing process gives very good results in the particular direction for which it is suited. The details are original, having been worked out by myself, and I trust will be found not wholly without interest to photographers generally.

Philadelphia, August 31*st*, 1865.

A JOURNEY IN SEARCH OF FOOD FOR THE CAMERA.*

BY A LAZY CONTRIBUTOR.

The more I see of Ryde the greater becomes the puzzle to understand how it ever became a very fashionable watering-place. No one can deny its attractiveness now, for its houses, like its visitors, are quite unexceptionable. But its rise has evidently been so rapid, if we may judge by the excessive newness of three parts of the town, that we have only to go back in imagination some twenty or fifty years at most when steam-boats were curious, but not excessively practical, and we should see, instead of the present very correct and proper town, a very modest and by no means excessively prosperous fishing village not numbering more than a hundred houses in all, and these straggling about on the side of the hill out of the reach of the sea at high water. No pier then broke the monotony of the flat muddy shore, and the inquiring tourist who made this place his landing-place to the island was carried from the barge-like ferry on the back of some stalwart fisherman, and after being carefully deposited in a cart, was jolted over a mile of muddy ground before he could with safety say that he had landed on *terra firma*. The town folks of Ryde owe much to the original projector of the pier, and should lose no time in erecting a monument to him if his name be not already forgotten, for, unquestionably, all the prosperity of the town must have dated from the completion of the pier, for even now, with its many attractions, what would Ryde be without this magnificent promenade out for the best part of a mile into the sea? Where else could those most fascinating sea nymphs, only to be seen at Ryde in all their glory, exhibit their negligent tresses and their thousand and one graces, to say nothing of their bewitching yachting attire, so unaffected, and withal so graceful? Not on the esplanade, for they would be so far removed from their apparently native briue that they would look quite out of their element. No; the only fitting place for the charmers is the pier, and that, too, on a stiff breezy day. Assuredly a walk at such a time will not easily be forgotten. On the contrary, the remembrance will out-last the toil of a whole year.

The muddy shore must be a serious drawback to the perfect enjoyment of those who prefer the bright sparkling emerald water to the very thick pea-soup-looking liquid into which they must of necessity plunge if they desire a bath. It will, however, at once attract the artist in search of the picturesque, for at all times of the day charming little bits present themselves. Now a collier high and dry on the shore, but not so dry either, for the outline of the hull and all the detail of its cordage reflected in the myriads of little pools left by the receding tide will give him employment. At another time, a group of horses, or a very rude primitive cart on its way to or from the ship, will engage his attention. Indeed, there is always something worthy of being done by the camera. Even the buildings along the shore are made more beautiful by the reflections in the pools of water at their basements. But besides all this, the lover of clouds will find much to do, for the sunsets on the Solent have been the most magnificent I have ever seen. Two or three very good views of buildings are to be made here. The new church is really beautiful, and is an important feature in a general view of the town from the end of the pier, as is also the campanile tower of the nearly-completed residence of Mr. Jabez Hughes, which is considerably the handsomest house in Ryde. The expenditure upon it has been made with free hand indeed, for the four seasons, in marble, look down from a lofty eminence into the street below. Great originality is shown throughout the design, and the result is something to be proud of. The view at the top of Union Street is very pretty for looking down the steep decline. The sea looks above the houses at the bottom; and far away, over the house-tops, the fleet can be seen at Spithead, and the smoke lazily rising in a great mass indicates the situation of the busy factories of Portsmouth.

"The French are nearly here!" is the cry on every tongue in Ryde, and all is excitement. The yachts, decked gaily with flags, are dancing with impatience, and eager to slip from their chains. One by one they bound off gaily eastward, and soon scarcely one is left. The end of the pier is lined with an eager crowd, all busily employed with double-barrelled aids to vision. Bathing is completely forgotten, and the machines are all idle. Curiosity is soon satisfied. One by one the vessels of the French, having rounded the point in regular procession, come slowly onward. Bang go the big guns. This, (interpreted by a salted and highly-cured specimen of that amphibious animal known as the British Tar, standing near me) means that the French flag-ship has saluted the Admiral of the English fleet. More banging of thundering guns, and the English Admiral has returned the compliment. This is the nautical way of saying "*Bon jour*," and replying "All serene." Lots more of figurative shaking of hands goes on in the same noisy way, and all is over; the general feeling in Ryde being complete disappointment—so much was expected. But the distance is so great, and the French have all gone on the Portsmouth side of the English fleet, and are very much shut out from view. Curiosity is not, however, to be baulked in this manner. Therefore, the steamboats carry off hundreds to make a tour of the united fleet. Some capital studies of an eager crowd could have been made, but the camera was idle and far away. Most surprising, however, not a camera was to be seen anywhere at work, and this must be admitted to be a very unusual occurrence on so momentous an occasion.

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* Concluded from p. 435.

With many regrets (for the sea side is a most seductive spot in these uncommonly-prolonged dog days) we start on our homeward journey, and, with many others, gratify our curiosity at the same time; for the steamer kindly takes us very near some of the French monsters. At Southsea all is excitement and confusion. The pier is a cloud of variegated colour, for it is almost covered with flags. Dispatch boats are cutting about in every direction, and along the shore the crowd is immense and very gay; for soldiers and sailors are in great force, and very jolly. We feel regret that we did not get over early to Portsmouth, but it is too late now; for the train is waiting, and soon we are dashing away homewards.

This comparatively brief rest has done good, for the camera is quite ready for work.

PORCELAIN PICTURE.—SIMPSONTYPE.

AS PREPARED BY H. T. MARTIN.*

As a short prelude to this article we deem it necessary to assure our readers that the porcelain pictures produced by our amateur friend are all that can be desired by the most fastidious; they are pictures by *reflected* light, and pictures by *transmitted* light accordingly as you regard them; they are bright and transparent—free from stains and all fogginess—in fine, true porcelain transparent positives.

Mr. Martin kindly went through the whole process in our presence, and gives us permission to make use of his formulas for the benefit of practical and amateur photographers, who cannot help but be grateful for the communication of the process, if they once try it carefully.

This process is a slight modification of the *Simpsontype*, as originally discovered and promulgated by our indefatigable and intelligent co-labourer, G. Wharton Simpson, editor of the Photographic News; it is sometimes denominated the *Collodio-chloride* process.

No silver bath is required; the collodion itself is made sensitive, and, in this condition, has to be preserved in a dark room. The vial containing the sensitive collodion is rendered impervious to actinic rays by a double coating of tin-foil; the same result can be effected by placing the vial in a tin case, or by coating it with several folds of orange-coloured paper or cloth. In our own practice we find the reddish-coloured sheets of india-rubber prepared for dental purposes answers the purpose better than any other expedient; we make use of this india-rubber when taking negatives of landscapes, placing it behind the collodion glass in the plate holder to prevent blurring, halation, or nubation.

Preparation of the Sensitive Bath.

Ether	1 ounce.
Alcohol	1 ounce.
Pyroxyline	12 grains (more or less as required).
Chlor. of calcium	3 grains.
Nitrate of silver	16 grains.
Citric acid	4 grains.
Castor oil	4 drops.

1. Immerse the cotton in the ether in small tufts, and shake the mixture in order to disintegrate the tufts as much as possible.

2. Dissolve the nitrate of silver, after it has been thoroughly pulverized, in a minimum quantity of water, and then add to it about two drachms of the alcohol, and mix intimately.

3. Add the remaining part of the alcohol to the ether and pyroxyline, and shake the mixture so as to dissolve the cotton.

4. Pulverize the chloride of calcium and dissolve the powder in the plain collodion No. 3.

5. Now carry the salted collodion, No. 4, and the alcoholic solution of nitrate of silver, No. 2, into the dark room, and add the latter drop by drop to the former, stirring between whiles with a glass rod. The collodion becomes milky by the action which ensues: the two salts, nitrate of silver and chloride of calcium, are mutually decomposed into nitrate of lime and chloride of silver, the latter of which gives rise to an emulsion; this emulsion is the *sensitive collodion.*

6. Now add the four drops of castor oil, shake the mixture well, and set it aside to settle for a couple of days; at the end of this time the undissolved cotton and the grosser parts of the contained matter will have subsided. The fine emulsion is then decanted into the non-actinic vial above-mentioned for use.

The intention of the castor oil is to allow the process of printing to proceed to almost any depth without the supervention of bronzing.

N.B.—Any plain collodion is suitable for the preparation of the collodio-chloride, if it produces a clear and transparent film on glass when dropped upon it and dried. The following, therefore, is the test of the collodion as to its suitableness for this process.

Pour a drop or two of the *plain* collodion upon a piece of glass and allow it to dry. If, when dry, the spot is as transparent as the glass itself, or undistinguishable from it, the collodion may be sensitized in the manner already described. If, on the contrary, the spot upon which the drops of collodion fell is opaque or milky ,it will be unnecessary to proceed any further with it—reject it and try a fresh sample of pyroxyline until the proper condition is obtained.

Preparation of the Opal Plates.

Select only *perfectly flat* opal plates for this process. Ground opal glass can now be had of our best photographic houses in the city. Clean the plates by thoroughly washing them in pure water. This washing will be sufficient if the plates have not been used before. If they have already been used, immerse them for a number of hours in the solution of

Bichromate of potassa	1 ounce.
Sulphuric acid	1 ,,
Water	1 pint.

Then wash them as before in pure water, and coat one side (the ground side) with the following solution:—

Clear albumen	1 ounce.
Water	6 ounces.
Ammonia	1 drachm.

This solution must be filtered before use, and the filtration must be repeated if the solution has been set aside for a day or two, or sometimes after a number of plates have been coated with it, because of the particles of dust with which it is liable to become impregnated during the time of the operation. A little camphor in the albumen solution prevents mouldiness.

The solution can be poured upon the plate in the same manner as collodion. It flows easily over the wet surface; if the latter contains a single particle of projecting matter, coat the plate again in order to remove it, and until the surface is perfectly free from bubbles and particles of every kind. Finally rear up the plate on the drying-rack for a few hours.

This substratum of albumen is a very essential operation; it causes the collodion film to adhere with great tenacity to the glass during the subsequent operation of toning, fixing, and washing.

As soon as the albumen film is dry, the plates are ready for the next operation, which has to be *performed in the dark-room.*

Coat the albumenized surface of the opal glass with the sensitive collodion above described, and allow the film to dry thoroughly.

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*From *Humphrey's Journal.*

The collodionized plates are next submitted to the fuming operation for about three minutes; if the weather be very warm, less fuming will be sufficient.

This fuming of the plate is an essential improvement of Mr. Martin's introduced into the Simpsontype, the free nitrate of silver in the film being thus converted into oxide of silver and nitrate of ammonia, a condition of chemicals in the paper printing process so conducive to happy effects.

The porcelain plates are now removed from the fuming chamber, exposed to the air a few minutes, and are then ready for exposure.

Shive's opal printing frames are indispensable in the next operation. They allow the operator to examine the process of printing and to remove the plate from the sun's rays as soon as the picture is sufficiently printed.

The negatives used and recommended by Mr. Martin are *sharp, vigorous, and deeply developed*, such as would produce good prints on albumen paper, such, in fine, as operators aim to produce in their daily practice.

Our readers will be greatly relieved to find that their ordinary negatives can be thus used in this delightful process.

The negative is then placed in the printing frame, and there fixed in its approriate place. The fumed and sensitized opal glass is next placed upon the negative, the two films (that is, the film of the negative and that of the opal glass) being in intimate contact.

N.B.—All negatives for contact printing must be taken on *flat* plate glass, otherwise the two surfaces of the two plates cannot be in *intimate contact;* and where this condition is wanting, a want of sharpness and vigour will be strikingly manifest in the resulting porcelain picture.

Place the printing frame with its contents in the sun's rays, and watch proceedings as you would if you were printing on a piece of prepared albumen paper.

Print *deeper* than is ultimately required in the finished print; that is, *over-print.* As we have said before, the castor oil prevents bronzing, and thus allows the picture to be *deeply-printed.*

Toning of the Porcelain Picture.

Wash the prints slightly in order to remove any excess of nitrate of silver, or other soluble salts, and then immerse the plates in an *old* lime-toning bath, or, if this should happen not to be on hand, in any toning bath that has been nearly exhausted during the day by the toning of albumen prints. In such a bath the porcelain prints assume an agreeable tone, which may be modified according to the taste of the operator, by increasing or diminishing the quantity of gold salt in the bath, or by modifying the length of the immersion of the plate in the bath.

Fixing the Porcelain Picture.

As soon as the proper depth of tone has been attained, the plates are removed from the toning solution to a bath of rain water, and there carefully washed; they are then placed in the following fixing solution :—

Hyposulphite of soda	2 ounces.
Water	20 „

The prints are soon cleared up by this bath, and become quite transparent and beautiful; they are finally washed thoroughly beneath the tap, and then dried.

The picture, photographically comprehended, is now complete; it remains for the artist to increase its beauty by the application of colour, whereby it becomes one of the most superb works of art.

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Photographs under Foundation Stones.—We notice that the custom of enclosing photographs with other documents in bottles and placing them under the foundation stones of public buildings is gaining ground. What a pity that the photographs for such purposes are not produced by a photographic enamelling proce

A NEW METHOD OF RECTIFYING THE PRINTING BATH.

BY D. C. CHAPMAN.*

The sunning process, which answers so well for the negative bath, has been found ineffectual for the printing bath: the red colouring matter yields only to kaolin, animal charcoal, or chloride of silver.

The following modification of the sunning process, which I have verified in a long practical experience, is, however, invariably successful. I describe it precisely as I practise it, and leave it to others to vary it, to suit any peculiarities of working which they may have.

When I find the bath, by use, has become of a dark brandy colour, and thus shows symptoms of disorder which needs curing, I put it into an evaporating dish, and, by rapid boiling, reduce it down to about two-thirds of its original bulk. I then remove it from the fire, and expose it, either in the evaporating dish or a clean bottle, to the direct sunlight. The sunning now will promptly precipitate the organic matter, and in a short time the solution will be perfectly colourless. When the sunning is completed, water is added to reduce it to a proper strength, and after filtration and the addition of alcohol, it is again ready for use.

In preparing a new bath, I make it alkaline with ammonia, and for each 10 oz. I add 1 oz. of alcohol. The alcohol maintains the good action of the bath for a longer time, and tends to prevent the solution of the albumen of the paper. Prints from an alcoholic bath have a more glossy surface than those from a plain bath.

[Such crude materials as kaolin and animal charcoal ought to be banished from the photographic laboratory. The above process receives our unqualified approval.—Editor of the *American Journal of Photography.*]

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THE CASE OF MR. MOENS.

It is stated that a London publisher has offered £10,000 to Mr. Moens for a work containing a narrative of his experience amongst the brigands. It is to be feared that he would have no opportunity of using the camera whilst amongst them, otherwise it would have afforded some admirable illustrations.

Some interesting details respecting the captivity are furnished by the correspondent of the *Times*, in a letter dated Naples, Sept. 4. The history of his sufferings is spread over 102 days, and those during the hottest summer we have had for many years in Italy. Of his wanderings, as they were within a comparatively limited district, it is useless to speak. By day the band reposed, when he was compelled to lie perfectly still, without moving or turning round; and from exposure to the sun and consequent thirst, at times passing the whole day without water, he suffered more than from any other cause. Occasionally they lay in caves, or even at the bottom of the hills near the towns, where they could see the soldiers passing almost close to them; but favourable as the opportunity would seem to have been for his escape, any alarm would have cost him his life, as orders were given to shoot him immediately if any such alarm were raised. During the night the band was continually on the move, either eluding the pursuit of the troops or prowling like wolves for their prey. For five days on one occasion Mr. Moens was without food, with the exception of a piece of raw meat, and was reduced to such a state of weakness that when food was found he was unable to eat it. The life of a brigand is therefore not without its sufferings, but, like gambling, it has its excitements, and if one day its history is that of want and anxiety, another has its compensations. During the whole time of his captivity he had but one chance of escape. At that time he was in a cavern, under the charge of three men, two of whom, who were lying in front of him, went to sleep, leaving their guns, one a double-barrel and the other a single lying by their side. He might have shot both with the double-barrel, and have had the single barrel in reserve for the man outside; but while he was hesitating what to do his eye, he says, fell upon this passage in his Prayer Book, which he happened to have with him,

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* From the *American Journal of Photography.*

"Deliver me from blood-guiltiness, O Lord." He then made up his mind to abstain from killing either. From the commencement to the end of his captivity his friends were able to communicate only five times with Mr. Moens, either to send letters or money. At last, they succeeded in sending the balance of £5,100, the largest sum hitherto paid for a ransom; and on the 25th of August he was sent to Giffoni, a place which has been fruitful of brigands, where his friends were waiting to receive him. Of Manzi, the chief of the band, Mr. Moens speaks well, or better than of the others, and considers him to be in a false position, from which he himself might wish to be delivered. By this chief he was treated well, and perhaps to him he is indebted for his life, or at least his preservation from great brutalities, for as to the others of the band, they appear to be perfect ruffians. Such as they were, however, Mr. Moens was not allowed to depart without some mark of gratitude for his conduct during his stay with them, and for the large ransom which he paid. Twenty napoleons were given to him for his travelling expenses, and five gold rings as a record of friendship as well as of gratitude. During the last week he has been in Naples, but was to have left yesterday, and though his privations and sufferings must necessarily have been great, his health does not appear to have been much impaired, and less so as for the last three weeks his treatment had been much better. The Italian papers have fuller reports of this affair than I am able to send you, but much they have published is apocryphal. The few particulars contained in this letter may be depended upon. With regard to the ransom money paid into the hands of these ruffians, it is divided amongst them in certain proportions, and then all gamble for it. The wind-up is that the money thus acquired rests in the hands of two or three, who sometimes themselves are murdered, or, if more fortunate, deposit their speculations with their friends, and then give themselves up to the authorities. On the 27th of August, indeed, two days after the liberation of Mr. Moens, one of a band wandering about the mountains of Salerno gave himself up to the authorities of Giffoni, the birthplace of Hanzi, and soon after a woman dressed in man's clothes, who as his lover had followed the ruffian in his wanderings, presented herself at San Cipriani. She had a wound on her right breast, and another on her left cheek—proofs of the active service in which she had been engaged. Altogether, Mr. Moens may congratulate himself that he has got off with his life and unmutilated.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, September 27th, 1865.

M. Dumas exhibited a very fine photographic portrait at the last meeting of the *Académie des Sciences*, the tone of which was marvellously fine, and said to be produced by pyrogallic acid prepared by an improved method by M. de Luynes, chief manipulator at the laboratory of the Faculty of Sciences. In consequence of the wonderful extent to which this developing agent is now employed in photography, it has become a product of daily manufacture. It is obtained by the decomposition, by the aid of heat, of gallic acid into pyrogallic acid and carbonic acid. The process at present employed is very imperfect; it yields only from 25 to 30 per cent. of pyrogallic acid, while theory assigns 75 per cent. By placing the gallic acid to be decomposed in a vessel hermetically closed, and heating it to 390° F., M. de Luynes effects the decomposition under incomparably better conditions, and the crude acid he obtains, even before being purified by evaporation in vacuum, suffices perfectly to the wants of photography, as the proof referred to abundantly testified.

M. Parmentier, of Nantes, communicates a new process for the preparation of chlorine, which will recommend itself by its simplicity and economy, inasmuch as it requires no heat, and furnishes instantly a large volume of gas with respect to the quantity of materials employed.

It is only necessary to put some hydrochloric acid in a bottle, and drop in a few pinches of chlorate of potassa; the reaction that takes place may be represented in the following manner:—

(6 H Cl) 6 equivalents of hydrochloric acid + (Ka Cl O^5) 1 equivalent of chlorate of potassa, produce (K Cl) chloride of potassium + (6 Cl) 6 equivalents of chlorine + (5 HO) water, 5 equivalents.

The gas given off is mixed with some fumes of hydrochloric acid, which may be removed by washing. But in most cases this precaution is useless.

Suppose, for example, that it is desired to produce some chlorine instantaneously, a small quantity only for an experiment; pour some hydrochloric acid into a flask or test tube, then throw in some pinches of chlorate of potassa, and immediately a disengagement of chlorine takes place. When the experiment is concluded, and no more chlorine is wanted, to stop the further disengagement of this gas pour some water into the flask, and the reaction stops immediately.

This ingenious process may be usefully applied to the purposes of disinfection. If, for instance, we wish to enter an infected drain, or well, or cess-pool, it is only necessary to procure a bottle and put into it the ingredients above mentioned, and let it down by a cord suspended to the neck into the place it is wished to purify; the gas escapes in abundance from the bottle, and the process of disinfection is quickly effected.

M. Gerlach, of Erlangen, makes a communication on the photographic production of histological preparations in their natural colours. He says "that he has for a long time sought to replace proofs in chloride of silver by others whose permanence may be be regarded as absolute. M. J. W. Swan has recently perfected an oft-tried attempt with chromic salts, gelatine, and carbon, and his process has suggested to me the idea of applying in photography the colouring matters employed in the imbibition and injection of the subjects prepared for microscopic researches. I first tried ammoniacal carmine, which is the finest colour employed for the above purpose. From the first trial I had the pleasure of recognizing that Mr. Swan's process permits not only of the application of solid pigments, like India ink, but also of diffused colours, like ammoniacal carmine. I soon obtained such excellent results that the observer can only with difficulty perceive the difference between the preparation which is in the field of the microscope and its photographic copy. Photography guarantees the exactitude of the drawing, and the colour of the proof is formed by the same colouring matter as colours the real object.

"I then applied the other colours employed in microscopic preparations, such as Prussian blue, indigo, carmines, and the sulpho-potassic salt of indigo. I employ Prussian blue for the injection of the veins and lymphatic ganglions, for which ammoniacal carmine is less adapted, and indigo for preparations by imbibition.

"Prussian blue gives proof of a dull blue colour, and the solution of indigo carmine loses all its colour in presence of the chromate of ammonia employed in the photographic manipulation, while the indigo is decoloured by the oxygen of all the chromates. I therefore turned my attention to aniline blue, which gave excellent results.

"The alcoholic solution of this colour, as it is found in commerce, must be diluted with ten times its volume of water, and incorporated with the solution of gelatine containing chromate of ammonia.

"In this manner we obtain copies presenting the greatest resemblance to the microscopic preparations obtained by means of one or the other above-mentioned blue pigments.

"I afterwards endeavoured to apply animal colouring matters, and particularly the colouring matter of blood. Blood simply beaten up will not answer, for the protean matters are precipitated by the chromates. I next boiled the blood, and, by pressing it between thick cloths, remove all the water that could be removed, and beat up the clot in a mortar with a little water. The liquid thus obtained was filtered and employed as above. The results were very poor, but I have no doubt more satisfactory ones may be obtained by employing finer filters. I propose trying other colouring matters, bile, for example, applied to the representation of muscular fibres coloured by that substance."

THE GELATINO-IRON DEVELOPER.

Sir,—Since writing my last I have made many more experiments on the preparation of M. Carey Lea's developer. The following formula, which is the best result of my experiments, will be found on trial to give a better result than that which I sent before. It is, moreover, easy to work. The gelatine and sulphuric acid being mixed over night, the solution may be prepared in a very few minutes in the morning:—

Sulphuric acid	1 oz.
Water	1 „

Mix and cool; when cool add:—

Gelatine	2 drachms.

Stir up, and leave for about twelve hours; dilute with water; render alkaline with ammonia; and then slightly acid with acetic acid. The whole may now be made up to about 30 ounces of a 15-grain protosulphate of iron developer, with 15 drops of common acetic acid to the ounce. This developer flows with great ease over the plate, and by working rather slowly renders the detail with great delicacy. There may be found, with some samples of collodion using this solution, a tendency in sun-lit landscapes to over-intensity, but this will not be general with highly bromized collodion. It will be seen that the acid and water might be kept "on stock" ready mixed, and that after one or two trials made with care the quantity of ammonia added might be measured, and thus the bother of litmus paper avoided. The acetic acid added (forming a small quantity of acetate of ammonia) will save the trouble of an accurate neutralization. The quantity of acetic does not much matter. I put about half a drachm into the given quantity of solutions.—Yours truly,

Belmont Lodge, Lee. Nelson K. Cherrill.

PHOTO-BINOGRAPHY.

Sir,—Apart from personalities, which I do not notice, the remarks in your last week's number leave me little to reply to.

Had I considered it useful to read again to members of the London Photographic Society, in Birmingham, the binographic tale I told them at King's College last June, I could have found time to do so; and as I am not ambitious of decoration by medals from Islington, or elsewhere, I do not try my fortune in such lucky bags.

My simple aim has been, and is, to place a new fact and its results in the reach of such as believe that our art is capable of something nobler than the dignity of a toyshop; and I know I can do this. The question at issue is, I venture to believe, a very important one, and, as I understand, has been accepted by Professor Wheatstone for his judgment; and notwithstanding your receipt of a hint from a mutual friend, as to the nature of the answer you expect, I have confidence in the issue, and shall receive the fiat with the respect due to the inventor of the stereoscope.

I may, however, observe, that I have practical proofs to submit to him on my side of the question, which have not yet been called for; and under these circumstances, perhaps, the hint given by the friend above alluded to is as premature as your announcement of it. However, be this as it may, I am ready with my part of the subject whenever called upon, although at present I have no idea as to how you have stated the case upon which the decision is sought.—I am, sir, yours, &c., Edwin Pettitt.

[In such a matter there was but one just mode of stating the case. We forwarded to Professor Wheatstone copies of the Photographic News containing everything which had appeared on the subject of photo-binography, from Mr. Pettitt's paper to the last letter then published, each communication marked for ready reference, and we accompanied these with a brief statement of the case and of Mr. Pettitt's request. Ours is not the duty of an advocate holding a brief for either side on a scientific controversy, but that of impartial recorder, and sometimes of moderator. As we have not made any announcement at all of Professor Wheatstone's supposed views we cannot have done so prematurely. We await his announcement at his time.—Ed.]

ON CLOUDS IN AUTUMN.

Sir,—How great a fire will a small spark enkindle! The shortest of short notes, written in protest against an overdose of praise awarded for a very meritorious picture taken by one of your contributors, has brought a hornet's-nest—excuse the comparison—about my unfortunate ears. With your permission, however, I would fain break another lance with my more friendly opponent, "Respice Finem."

In the first place your correspondent, or contributor, read my poor little hurriedly-written note more carelessly than he says I did his article. I certainly was not quite so absurdly stupid as he accuses me of being. I did not speak of all clouds having but one kind of shadow, but of *a* cloud and *a* shadow, viz., that said to be in Mr. Robinson's "Autumn."

As "Respice Finem" asserts himself to be an artist and an observer of nature, I must confess his assertions rather astonished me. He evidently thinks that because I did not see the cloud which so curiously plunged one of Mr. Robinson's gleaners into midnight gloom, and, strange to say, left another, close beside, shading her eyes from the sunlight, that I have no right to speak as I have spoken. Let me see if I can enlighten him. A cloud may be described, though unseen, by noting simply the conditions of light and atmosphere by which the cloud and its shadow must inevitably be affected. The higher and less dense the cloud, the fainter and more diffused will be its cast shadow on the earth below. The larger that cloud, the darker will be that shadow; but as cloud shadows do not grow black all at once, it will always be light at its edge.

But "Respice Finem" points to nature and poetry as evidence against me, by quoting Mr. Ruskin and some poets, and by describing a storm-cloud witnessed when he, "Respice Finem," was at sea. I fancy your contributor is still at sea, for what connection can there be between two scenes so very far different as one in which *a single foreground figure* is thrown into "the shadow of a cloud," because the artist wanted a mass of dark for his composition, and one in which a rising storm-cloud plunged miles of distant water into the gloom of a flying storm? If "Respice Finem," while talking to the captain, had seen him suddenly vanish into thick darkness, while "Respice Finem" stood shading his eyes from the overpowering brilliancy of the sunlight, I could have admitted myself defeated with a tolerably good grace, for I believe, as Cicero said, "All are liable to err, but fools only persist in error," and whether I be a fool or not, I am really anxious not to be thought one.

As to the quotation from Mr. Ruskin, now, truly, can anyone fail to see the striking and palpable dissimilarity there is between what Mr. Ruskin so eloquently describes and what Mr. Robinson photographs? Mr. Ruskin simply depicts the low "mist wreaths" of early morning forming themselves into clouds and rising as the air grows warmer; tells us how the "grey net-work" spread itself over the sky until the light was eclipsed and the birds went to roost; and then describes so beautifully the low dense stratus clouds stealing out and casting *black* bars of shadow over *the darkened landscape.*

Mr. Robinson's landscape is full of clear, bright, sunny air, and the horizon is a cloudless one. Need I say more?

With regard to the poetical quotations, "Respice Finem," as an artist and observer, ought to know that—thank goodness!—poets do not pretend to literal or scientific accuracy. Did your contributor ever see the midday sunlight look "golden," hills "blue" or "purple," unless it chanced to be on a tea-board? I remember reading, many years ago, in the *Artists and Amateurs' Magazine,* edited by a clever painter (E. V. Rippingille), an article by one of the R.A.'s on this very subject, showing what a lamentable result would follow a painter's taking a poet's description as his guide for a painting. I commend the perusal of that article to "Respice Finem." I found them useful when very young in art knowledge—I shall never be old in it—and others similarly situated may also find them serviceable. In that same book, too, I remember there were some letters from Ruskin on this very subject of cloud-shadows.

And now, sir, I have said my say. "Lay on Macduff!" I ask for no mercy; I speak only according to the light that is within me, and if your candles are more brilliant, open your lanthorns and let their light shine out before men, so that, instead of giving light, I shall receive light, and be none the worse for the process. But why abuse me individually?

I am very sorry to add that, not being convinced of the error of my ways, I am wicked enough still to irritate Mr. Robinson's "out and out" admirers, by subscribing myself in all humility, but with some pride too, yours, &c.,

An Artist.

Photographic Notes and Queries.

The Landscape Medal at the Cornwall Polytechnic Exhibition.

Sir,—With reference to the letter of Mr. G. Restall, in your impression of the 15th, I beg to say that when Mr. Warner forwarded the photographs to our Exhibition he stated that they were only printed by him; but we, of course, concluded that they were sent with Mr. Restall's knowledge and sanction. The judges have done their part by awarding a prize to a very excellent collection, and the question now rests between Mr. Warner and Mr. Restall. From the statement of the latter he clearly seems entitled to the prize; and as Mr. Warner has not replied to his letter, the society will withhold the prize for the present. If Mr. Warner has made an unwarrantable use of the negatives, Mr. Restall surely has some remedy.

I wish to correct the statement that the prize in question is for the *best* landscape. Mr. Mudd, of Manchester, is the holder of that prize.—I am, sir, your obedient servant,

Sydney Hodges, *Secretary*.
Royal Cornwall Polytechnic Society.

[So far as we understand the matter, it stands thus:—Mr. Restall is the photographer by whom the landscapes were selected and the negatives taken; Mr. Grant is the proprietor of the negatives; and Mr. Warner the printer, who has, from what we glean, also printed in some clouds of his own. The merit in such case seems to be divided. Mr. Warner seems to think that the medal was awarded for printing and for clouds. From the letter of the secretary, and his official list of awards, now before us, this appears to be an error. Since the merit appears to be divided, and the medal cannot be treated in like manner, we may suggest that by awarding two medals, one to Mr. Restall, and one to Mr. Warner, the difficulty might be met. We are happy to make the correction suggested in the last paragraph of Mr. Hodge's letter; but we may remark that in the list of prizes, to which we have referred, bearing Mr. Hodge's signature, we find the award to Mr. Mudd thus stated:—"For the picture showing the greatest photographic skill and artistic taste, the first silver medal, as the premier prize in this department—Ullswater Lake, James Mudd, Manchester." The award to Mr. Warner is given as stated in the note to his letter.—Ed.]

Sir,—I beg to refer Mr. Restall to the catalogue containing the list of prizes awarded to the exhibitors at the Falmouth Exhibition. He will there find that the medal was awarded for "the printing" and "the clouds." I had Mr. Grant's written permission to exhibit what negatives I pleased. I regret that Mr. Restall should have written so hastily; he would not have done so, probably, had he (Mr. Restall) understood that the medal was awarded for "the printing and the clouds." I am open (with Mr. Grant's permission, and at Mr. Restall's expense) to print the negatives as they are, without either masking or clouds, and submit them to any competent judge in London or elsewhere.—Yours faithfully,

W. H. Warner.

Ross, 26th September, 1865.

[There is some singular mistake here. If, as Mr. Warner understands the matter and states above, the medal be awarded for "printing and clouds," he has doubtless received the award legitimately. But if so, how does it happen that in the official list of prizes, bearing the written signature of Mr. Sydney Hodges, the secretary, the award reads thus, "For the best Landscape, Silver Medal, Old Divie Bridge, W. H. Warner, Ross"? It is quite possible that much might be due to the printing and the clouds, but the matter certainly needs further explanation. See the letter of Mr. Sydney Hodges above.—Ed.]

North London Medal Award.

Sir,—Will you kindly afford me space for the following few remarks in reply to a letter which appeared in your last number, signed "An Unsuccessful Competitor."

1st. Allow me to state that I had no private interview with the jury; my goods were carefully and publicly examined.

2nd. I will merely observe that this is by no means the first time that my goods have been considered superior to those of my protesting neighbours, not only for quality of workmanship, but for originality of design and perfection of mechanical arrangement. In 1862 mine was the only portable binocular camera with movable centre partition, hinged focussing screen, and folding bottom with screw adjustment, for plates above the stereoscopic size shown at the International Exhibition, and specially recommended by the jury. (See Report, page 9).

In 1863 I received the medal of the Photographic Society of Scotland for the same form of camera. To this I may add, that one of the leading architects of Scotland, himself a successful inventor of cameras, pronounced my camera perfect in its mechanical arrangements; since then, woodcuts of the camera have continually been published in the various photographic journals, yet it is only in 1865 the protestors claim to be the inventors of that for which I have been twice publicly commended. Can they refer the jury to one single instrument made with the peculiar features referred to, previous to the publication of my drawings. I am prepared to prove that I have made and sold hundreds of this form of camera, and to produce testimonials from the photographers who are using the cameras.—I am, sir, yours, &c.,

P. Meagher.

Talk in the Studio.

Splitting of Collodion Films.—The Editor of the *American Journal of Photography*, in reprinting an article from the Photographic News on this subject, adds:—"A more frequent occasion of exfoliation than any of those above enumerated is the acid condition of the plate. If the plates have been treated with acid, any amount of washing in simple water will not remove the acid effect, when there is a tendency otherwise towards exfoliation. Any alcali neutralizes all the acid."

Amateur Photographic Association.—Mr. Cooper, Junr., should have been included in our last amongst those who received certificates of honorable mention, as well as amongst those who obtained prizes.

Meetings of Societies.—We remind those of our readers concerned that the winter session of meetings of most of the societies will commence next month. The North London Meeting will be held at Myddelton Hall, on Wednesday next, and the South London Meeting at the City of London College, on the evening of the 12th proximo.

Photographs of Welsh Bards, &c.—At the Eisteddfod just closed at Aberystwyth, Mr. W. Griffith received the first prize, a silver medal, for his series of photographic portraits of Welsh bards, minstrels, and literary, scientific, artistic, and other popular men.

Stains in Prints.—A correspondent who was recently troubled with peculiar stains of one shape on the back of his prints which extended to the front, informs us that he has found the cause in a japanned waiter, upon which the prints were laid to dry. We presume it had been japanned iron, and the japan had been removed in one place, thus staining the prints with iron. It often strikes us with surprise to witness little acts of carelessness of this kind, the source of numerous troubles which photographers thus voluntarily encounter.

Splitting of the Film and the Gelatine Developer.—Another correspondent, signing "Kent," informs us that he has suffered from films splitting off where he has used the gelatino-iron developer, but that a coating of dilute gum arabic before drying the plate prevents it. We cannot see any reason why this developer should produce such an effect, as its whole tendencies would seem to be in the opposite direction. If in the preparation of this developer, free sulphuric acid were left, it possibly might produce such a result; but if the developer be prepared properly, splitting of the film is most probably the result of an extraneous cause which chances to be present. See an interesting letter on this developer by Mr. Nelson K. Cherrill in the present number.

To Correspondents.

J. R. (Bristol).—For commercial purposes it is probable that the ordinary method of silver printing will continue in use for some time to come. At present we know of none which promises to supersede it altogether, 2. You will find several articles on printing on opal glass in the Photographic News during the last few months; one in the number for May 12th will be useful to you. If you carefully follow the instructions there given, you will have no difficulty. We regret that we have no time for writing private letters to answer such questions as these.

T. W. Jennings.—All the portraits show a tendency to under-exposure and over-development, which issues in chalkiness. It is a much better fault to slightly over-expose, and thus secure softness. It is very difficult to print a background round a group of small figures on a card without getting a hard line, and the result will be rarely worth the trouble. The "Priory" is the best picture. The tannin process is probably the simplest dry process, and the collodio-albumen the most certain. You will find a formula for the developer in our present number, which will probably be most satisfactory.

Lex.—We know nothing of the place nor anything further of the matter than was stated by our correspondent. We believe there is no fear whatever of photography, as a business, ceasing to be remunerative. Our duties are with it as a science and an art, and we cannot here effectively advise any one in regard to its business aspects. It will, of course, be subject to the same laws as other business undertakings, and will require more or less of capital, skill, judgment, and opportunity, to secure high success. We can readily understand that when some one or more of these requirements are wanting, the position may be a hard one. We regret that we cannot give you efficient business advice; but we should certainly try a fresh locality. We like the landscapes best of the pictures enclosed. The little girl with ferns would have been good, if it had been sharp. Your background is a little too small; it destroys the neatness of a picture when the edges of the cloth, and the nails used in fastening it to the frame, are apparent. Your background is also too much in focus, and shows the texture of the cloth. A little attention to these points, which constitute neatness, will be an improvement.

C. T.—The best blinds for shutting out direct sunlight without taking away too much light are those of tracing linen, the material frequently used by architects for tracing. 2. Any quiet paper without much pattern, of a neutral grey, will answer well for the studio.

Nitrate.—The best information on the production of opal pictures will be found in various articles in our pages during the last few months. An article on May 12th is most precise. 2. We do not like the addition of acetic acid to the nitrate bath, as when once a nitrate bath containing it gets out of order, it is very difficult to deal with. We prefer dilute nitric acid; and then, if the bath gets out of order, it is easy to neutralize and sun it, or boil it, to get rid of accumulations of organic matter. The best plan with a bath containing acetic acid, which gets out of order as you describe yours, is to abandon it altogether, and make a new bath.

Anne.—The lack of vigour in your collodio-chloride pictures on glass may be due to the use of a weak negative, or possibly you do not print deeply enough, or it may be the fault of the sample of collodio-chloride; from your description it appears not improbable that the collodion is too thin, and that the addition of a little more pyroxyline would be an advantage. If you dry the film before the fire, and use as soon after as possible, you will have less difficulty. We have found sometimes that in spontaneous drying there was a tendency to crystallize. We have not tried how long the coated plates will keep. 2. The toning and fixing bath in one recommended for the Wothlytype process may be used more than once. We should not have faith in the fixation, however, without the use of a fresh hypo bath each time, after the bath recommended.

B. B. L.—Your negatives are too weak, and apparently fogged in the shadows. In order to secure good tones you must have negatives which will permit sufficiently deep printing in the shadows; we prefer to see a little bronzing always. Print deeper and tone a little deeper if you wish to get black tones.

W. H. James.—If the light be good, the exposure is, doubtless, long. Your best plan to assure yourself of the cause of such a case is to make a fresh bath, and try with another sample of collodion, and then compare the results of the two. A bath, made as you describe, containing acetate of silver, is sometimes in condition to produce very rapid results, but it very easily gets out of order, and works very slowly. We prefer a bath slightly acid with nitric acid, and a bromo-iodized collodion. The difficulty with acetic acid is, that the condition of the bath containing it is prone to change, and once in the bath there is no practicable method of getting rid of it.

Ben Lomond.—See letters in another column.

Stained Proofs.—The stains on the print enclosed are due to imperfect fixation. The paper is very thick, and it has either been imperfectly immersed, or stuck to another print, or the fixing bath has been too weak, or the print has remained too short a time. The result is that hyposulphite of silver is formed in the print, and not redissolved by excess of hyposulphite of soda. The hyposulphite of soda, being very unstable, generally decomposes within a few days, sometimes within a few hours, and causes the yellow stains.

An Unlucky One.—We fear that there is no help for your mishap. We cannot tell what was the colouring matter of your "light trousers," upon which the cyanide has acted to produce a yellow stain. The best plan to deal with silver stains is first to apply tincture of iodine, and then follow with hyposulphite of soda.

J. F. F.—The cause of the opaque stains you describe is the partial drying of the film before development, the trouble chiefly occurring in hot weather, and one mode of avoiding them is to use as much despatch as possible in the operations. A new bath, however, or one quite uncontaminated with organic matter, has less tendency to produce these markings even when the film partially dries. If the drainage of the plate come into contact with a dirty inner frame, the contamination of which is carried back on to the plate by capillary attraction, there is a greater tendency to these stains.

Chemicus.—We have not had time to test the sample of pyroxyline which you enclosed; but judging from the description of results, it seems probable that you make it at too low a temperature. It is also possible that your solvents are not sufficiently highly-rectified, and the presence of water in the collodion tends to give it a gelatinous character. 2. Tincture of iodine applied to the stain, followed by hyposulphite of soda, is the best agent for removing silver stains from linen.

West of England.—The lighting in the pictures sent is, in most cases, imperfect. It is clear that the reflecting screen is not used efficiently. Almost all the pictures are under-exposed, and the negatives lack density as well as detail. It is impossible to judge of the quality of the lens, as so many of the pictures are out of focus. The difficulty in getting a good black tone arises chiefly from the imperfection of the negatives. It is impossible to get a good print without a good negative; it is necessary to have sufficient contrast and density in the negative to allow the blacks to be very deeply printed; there will then be no difficulty in getting good blacks, whilst, without sufficiently deep printing, it is impossible to obtain a black. The tinting of the old china is very fairly suggestive. We cannot, with propriety, recommend particular lenses or particular makers in this column. The question as to further intensifying, when using the new developer, must quite depend upon the amount of density already obtained. There is no need for apology in consulting us, but a few practical lessons are evidently the chief want of our correspondent. Failing that, try to get hold of a good negative, and then strive to equal it.

F. F. S.—We do not hold the position of referee; but we made the proper enquiry, which resulted in an examination of the circumstances, and it was then discovered that, although the prints had been ready and put aside to be sent several months ago, through the carelessness of an assistant they had been put aside and overlooked. They were sent off at once, and will, doubtless, arrive as soon as this copy of the News.

J. W.—Your question is a legal one, and a non-professional opinion will not, we fear, be of much value to you. But so far as we understand such questions, if you are the legal representative of your deceased brother, the landlord's agreement with him is binding with you. In any case you cannot be turned out of the studio, we apprehend, without six months' notice, and, if we were in your position as you describe it, we certainly should not go out in a less time if it were not convenient or profitable to do so.

X. R. X.—The condenser in the solar camera is a large double-convex or plano-convex; its sole purpose is to collect and concentrate the sun's rays to a focus. 2. Its use is to secure intense light to print the image. 3. It is comparatively useless for diffused light, and it is not usually achromatic. 4, 5, and 6. A lens is achromatized by the use of two kinds of glass, each of a different density, and not by any modification of curves in one glass. 7. It might be possible to construct a condenser by means of two concave glasses filled with water; the achromaticity of such a lens would depend on the relative density of the glasses and water, the proportion each bore to the other. 8. If, after allowing the rays of light to pass through a collecting lens, you interpose a dispersing lens, you alter their direction, of course, and lessen their intensity. As to whether you gain an advantage by such a course entirely depends on the object you have in view. 9. If you can, with equal convenience, receive the sun's rays direct on the condenser, without the use of a reflector, an advantage is gained. 10. If printing by the solar camera be effected by development, the prints do not usually require toning; if printing right out be adopted, then the printing is done in the usual way, both in exciting, toning, and fixing.

Solar Action.—Received, and shall have due attention.

Photo (Falmouth).—See letters in another column.

Several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. Thomas C. Bayfield, Horsham, Sussex,
Two Photographs of Horsham Old Church, from an oil painting by Fred. Burstow, of Horsham.
Mr. Arthur Nicholls, Newnham Grove, Cambridge,
Photograph of All Saints' Church.
Mr. Frederick Snary, 26, Castle Street, Bristol,
Photograph of Hon. Charles Thomas Clifford.
Photograph of Rev. William Rose.
Photograph of Rev. William Lawson.
Photograph of Rev. James Ward.
Photograph of Rev. J. H. Batt.
Mr. Henry Robins, Surrey Street, Landport,
Photograph of the Launch of the Portsmouth and Nayling Life Boat.
Mr. John Wilton, Newcastle, Staffordshire,
Photograph of Madame Tonnelier.
Photograph of Mr. Charles Durand.
Photograph of Mr. W. Parkinson.
Delany and Co., Lowestoft, Suffolk,
Photograph of Countess Stradbroke.
Photograph of Lady Sophia Rous.
Photograph of Lady Augusta Rous.
Photograph of Lord Dunwich.
Photograph of Sir Edward Goach, Bart.
Photograph of General Wingfield, C. B.
Mr. James Armstrong, Carlisle,
Photograph of Local Electioneering Caricature.

THE PHOTOGRAPHIC NEWS.

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THE JURORS' REPORT AND AWARDS AT THE DUBLIN EXHIBITION.

On another page we publish the jurors' report and list of medals awarded in the photographic department of the Dublin International Exhibition. The formal announcement of the awards was made at the Exhibition Palace on Monday evening last, when the whole of the building was brilliantly lit up, the ceremony being attended by many distinguished persons; Earl Russell presiding, and making an excellent speech.

The jurors in the photographic department were Mr. A. Claudet and Mr. P. Le Neve Foster; Dr. Diamond was also appointed on the jury; but a postponement in the period for examining the contributions prevented the possibility of his attendance at the time, and he has not, therefore, taken part in making the awards. We should have been glad, as doubtless would also the acting jurors and the exhibitors, if a gentleman so experienced and accomplished in everything concerning our art had been able to have taken part in the examination of contributions and awards of merit; although the photographic and scientific ability and high character of the gentlemen who did act leave nothing further to desire in this respect, and their report and awards will, in their main features, we doubt not, command the acquiescence and approval of all whose opinion is worth having, and who have not petty purposes of their own to serve by grumbling.

The number of medals awarded to English photographers is twenty-six, which, considering the number and excellence of the contributions, although displaying liberal appreciation, cannot be regarded as unnecessarily lavish. Of the eight who received medals at the North London Exhibition, we notice that five have received awards in Dublin, and the other three of the North London medallists were not exhibitors at Dublin. This fact is, we think, significant in regard to the grumblers at the North London awards.

Many of the introductory remarks in the report we commend to the attention of photographers as especially worthy of consideration; they might, indeed, with great propriety be regarded as a series of hints for the guidance of intending contributors to any photographic exhibition. At the risk of some repetition, we extract here two or three paragraphs which might perchance be carelessly read or overlooked in a long report, and which we think ought to be especially studied and remembered:—

> A cursory inspection of a number of photographic portraits will generally enable a correct judgment to be formed how far the operator is a person of taste and refinement, and has had artistic training. Such men never exhibit what is deficient in effect and composition; as they cannot always be successful, they have the good sense to know their failures, and they reject or destroy every negative, however perfect it may be as a photograph, if the artistic effect and composition are not completely satisfactory.
>
> The choice of the subjects for exhibition is another test of the artistic training and natural disposition of the operator. The portraits exhibited should be of eminent persons, in whom the public take an interest, the principal merit in such an exhibition being its historical and instructive character; or they should be selected as illustrations of beauty of features and excellence of form. A photographer who exhibits productions without reference to these conditions, however perfect they may be as the result of manipulation, lowers the art he is practising, and shows that he is not an artist.
>
> The same remark may be made respecting the reproductions of landscapes, buildings, and views of ancient and modern architecture. None should be exhibited if the subject has nothing to make it interesting. The subject chosen by the photographer is the surest criterion of his feeling and taste, and in exhibiting pictures which please the eye and elevate the mind he ennobles the art he is practising. The *desideratum* for a photographer is to know when he has succeeded in producing a satisfactory result—and this, it appears, is not so easy a matter.
>
> It is not to be supposed that such men as Bedford, Maxwell Lyte, Mudd, England, Heath, and others, have never failed in their attempts. But they have had the judgment and good taste never to exhibit a picture which is not remarkable in some of the qualities which distinguish the true works of art. When we examine the specimens exhibited by such artists we cannot but acknowledge their excellence, that they do the greatest honour to photography, and are capable of elevating it to the rank of fine art. Vulgarity and absence of taste have been the greatest enemies of photography, and, if not checked in time, will degrade the art and cause the decadence of that marvellous discovery of which there appear already too many signs.

Some of the contributions at the North London Exhibition strikingly illustrate one of the evils here so forcibly pointed out—namely, that some men do not know when they have failed, and exhibit a hetereogeneous assortment of pictures, which marks their absence of knowledge and culture; whereas, if even they had not the skill always to produce good things, if they had only the knowledge to select the good produced, perhaps by chance, and reject the bad, they might materially tend to improve the general character of exhibitions, and secure for themselves at the same time a high reputation.

When the medals will be distributed we are not informed; but the Exhibition will remain open a month longer, so that there is still time for those who are desirous of availing themselves of the continued fine weather to visit the Irish metropolis, and examine a display of works of art which, if small, is full of interest, and will well repay the visitor.

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PHOTOGRAPHY IN INDIA.

It has been generally understood in this country that in India the pursuit of photography was attended with numerous and trying difficulties. The rapid decomposition of perishable chemicals from the high temperature, the non-actinic light, the heat and consequent rendering everything in the way of active exertion, absolutely necessary in landscape photography, at least uninviting to the photographer

—these and various other considerations might, we can readily conceive, render amateur photography a rare thing in photography. Notwithstanding this, if we may judge from the evidence which reaches us, there is no country in which a greater interest in photography prevails than in British India, and few of the photographic journals which reach us afford us more pleasure in glancing at their contents than the *Journal of the Bengal Photographic Society*, published quarterly in Calcutta. Of course we do not seek in its pages for new processes or discoveries, nor for important scientific information not to be found in European journals; but we find a most interesting record of the proceedings of the society in Bengal, and of the habits and interests of the photographers there; and we receive, moreover, with each number a photograph of Indian scenery, which affords us some idea of the degree of excellence attained in our art by those working in the midst of the disadvantages to which we have referred.

The number of this Journal for March contains the annual report. We learn that the society is in a very flourishing condition. The number of members is between 300 and 400, and the balance in the treasurer's hands amounts to 1,753 rupees, equivalent, we believe, to about £175 sterling, whilst a sum of 2,516 rupees, or over £250 sterling, is due from members whose subsriptions are in arrears. From one paragraph in the report we learn that the society has taken a step which might with advantage be imitated at home; they have procured from Europe a very large and handsome album, at a cost of 300 rupees, or £30, for the reception of contributions of pictures made to the society.

A very excellent photographic exhibition was held during last year, at which two gold medals and five silver medals were awarded. Of these medals a photograph of the full size of the obverse and reverse is given in the March number of the *Journal*. The design is excellent, the die having been executed in this country by Mr. Wyon. The gold medals weigh 7. 15. 0 tolahs each, and are each intrinsically worth 16 guineas; the silver medals each weigh 5. 15. 0 tolahs, and are worth intrinsically about £1 12s. each. The dies cost about 70 guineas. It will interest some of our readers to learn that a well-known English photographer takes two of these medals: Mr. S. D. Bourne, late of Nottingham, takes a gold medal for the best series of ten landscapes, and a silver medal for the best single photograph in the exhibition. Mr. F. Schwarzchild received a gold medal for the best series of ten portraits; Lieut.-Col. Keyes, C.B., for the best series of ten photographs, whether portraits or landscapes; and Mr. J. A. Melany for the best series of twelve stereographs.

An excellent review of the exhibition gives us some interesting details of the pictures exhibited. Of Mr. Bourne's single prize picture, No. 110 in the Catalogue, it is remarked:—

> In No. 110 we have a perfectly lovely picture. The piece of bank and the two trees on the left form a rich dark mass which embraces, as it were, the rest of the picture, and gives by contrast great value to the tender gradations of tint in the middle and extreme distance. In this mass of shadow, however, notwithstanding its rich depth, there is considerable detail, although, happily, it does not cut up the breadth of the whole. On the right, leading to the middle distance, we have a delicious passage of light, soft-foliaged trees; their slender stems steeped in shadow; beyond them a glimpse of distant light, and beneath, a brilliant sparkling fringe of pebbly bank, the margin of the transparent stream which here and there, broken by varied reflections and more glittering pebbles, carries us further into the picture until we reach the poplars in the extreme distance. These vertical forms help the composition wonderfully, and their distinctness and yet great tenderness of tint is certainly exquisite. As a picture it is perfect, and but for one trifling defect it would have been equally so as a photograph. This one blemish is the small mass of foliage drooping from the top right-hand corner, which is a mere blot of dark, unrelieved by any of those specks of detail which lighten and enrich the rest of the mass of shadow. Fortunately, the effect of the picture as a whole is not injured by this, and we doubt whether it could have been different without sacrificing some other part.

Of the prize portraits by Mr. Schwartzschild, it is remarked that, notwithstanding their excellence, they are—

> Precisely of that kind which put a critic upon his mettle and make him strive to find *some* flaw or objection to urge against the otherwise overpowering weight of eulogium which he would have to pass on them, and in awarding which he would only be repeating what has been already said by all those to whom the works of this photographer are known. We confess candidly that, for the benefit of our report (and also in the hope that, by pointing out the few and slight blemishes which we might be able to discover, Mr. Schwartzschild might be assisted to arriving at even greater perfection) we approached these works with most uncharitable and peevish minds, determined to find fault if we could; and we were not altogether unsuccessful. Thus we remarked that Nos. 268 and 258 were a little too hard, and wanted more half tint. No. 267 shows the same defect; of the dress in the latter picture we have already spoken in noticing two portraits by Mr. Pereira, Nos. 152 and 153. In No. 263, again, the white hat in the corner craves more urgently for attention than the very fine portrait, to which it is supposed to be merely an accessory. Were we, indeed, to apply the painter's doctrine of "principal and secondary lights" to photographic portraiture generally we should find in nine cases out of ten that we have portraits of hats and trousers to which the wearers were, pictorially, quite unimportant accessories.

The critique of the exhibition, which appears to be an official document in the character of a juror's report, concludes with a regret that more is not done in figure photography. It remarks:—

> Especially would we rejoice to see greater competition in that most difficult branch of Photography—"Portraiture." This, and its adjunct "grouping," is almost entirely neglected in India by amateurs, and yet we believe that nowhere is there so great a scope and so interesting a field for its pursuit. Dr. Simpson's vignetted heads have stamped themselves on the memory of all who have seen them, and are valuable, apart from their merit as pictures, as records in Ethnology. From Cape Comorin to the Khyber Pass, India abounds with the greatest variety in race and feature, with the most picturesque costumes and drapery; in short, with every inducement to a study at once so interesting and so valuable. To the ordinary spectator, figure-photographs have more interest than landscapes, and clever posing, grouping, and execution, stamp the genuine artist photographer more than any other branch of the art.

The Journal, besides the reports of the meetings, contains papers of interest. The December number contains an interesting account of a visit to Herr Wothly's studio, by Mr. F. Schwartzschild, who visited Europe last year. The visitor was charmed with Herr Wothly's manner, his method of working, and his results. He says:—

> Contrary to our expectations, Mr. Wothly, who is generally known as one of those photographers who are always afraid that their secrets should be discovered, promised to show us the whole process, and during a capital breakfast, while sipping his excellent Rhein wein, the topic of conversation of course turned upon his new invention. He told us that he had spent a large sum of money in experiments connected with photography, and that he was obliged to trust to this process for reimbursement. I shall only explain what we saw of the manipulation. We were taken to his dark room where he told us the paper was sensitized. He took a sheet of paper and fixed it on a board with a pin, and covered it with a kind of collodion, just as we collodionize our negative plates. The collodion was rather turbid and of a yellowish colour; it contains a double salt of Uranium. The paper itself must have had a previous preparation, because the collodion did not sink into the paper, but remained on the surface, forming thus a soft glaize. The paper so prepared was then hung up and dried, which took about a quarter of an hour; it was then placed under a negative in the usual way, and exposed to the rays of the sun.
>
> I believe that it was a little more sensitive than our chloride of silver paper, and the print, when taken out of the frame, was of a dirty brownish colour. It was at once submerged in water, and then the fixing solution, where it remained about ten minutes; then again washed under a tap for a few instants, put in the toning solution, where it acquired, in the course of a few minutes, a most beautiful tint. He took it out again and washed it for about half an hour; hung it up to dry, and all was done.
>
> We spoke much about the permanency of these prints, and he assured us that he had the paper analysed, and no destructive elements were found—that he could warrant them to last for years. This, of course, remains to be proved, and time alone will show if his anticipations are correct; because it will be remembered by old photographers that our present process was also guaranteed by the inventor as perfect as a process could be, but time has shown us the defects.

The March number opens with a leader remarking that, since the publication of the Wothlytype formula, and the discovery that silver was employed, the hopes entertained in regard to it had diminished in some quarters. We have next an açcount of a photographic trip to Simla, which we find to involve an amount of travelling not often dreamt of in photographic tours in this tight little island. What will our readers think of travelling a thousand miles, and then discovering that the dark slide had been left at home? Here is an extract from the narrative:—

> Reader! Did you ever travel 1,000 miles to take a picture? Did you ever return without getting one? If so, you may probably be able to sympathise with our misfortune. The Collodion was good, the bath in first-rate working order, the camera and lenses the best procurable, the glasses clean, and the view and atmosphere everything that could be desired. But the dark slide was left in Bengal. What could have induced our evil genius to have selected this as his share among the many articles necessary to a photographer I know not; but such was his selection, and by it our hands were paralyzed. One hope was left us,—we had an able photographic friend at Simla, and to him we determined to apply for the loan of a dark slide.
>
> Giving up all thoughts of photography for the time, we wended our way onward down the steep descent from Kussowlie to the fort of Subathoo, thence by Pukdandee and Landowee; round the base of the hill we came to the charmingly picturesque chain suspension bridge, and the magnificent gorge that leads to it. Here the loss of the "dark slide" was deeply felt by us all. Anything more picturesque and suitable to the stereoscope than the views about this locality cannot be imagined; they, however, were irretrievably lost to us, and we were not sorry when we concluded our first hill march a few miles further on, and reached the Bungalow at Hurreepoor.
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> * * * * * *
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> Our photographic effects were considerably marred for some time by the rapidity of our travelling. The Indian rubber top to the bath, too, that had been supplied by an eminent Calcutta firm, turned out to be vulcanised, and we were foiled for some time in getting any satisfactory results. A little doctoring, however, soon set things to rights, but we were necessitated even after to carry the silver solution in a separate bottle and decant when required. The last and perhaps the most interesting of all our excursions from this place was to the top of "Hatoo," a height of nearly 11.000 feet. It was a heavy pull, but well worth the exertion. From the summit the whole of the horizon is visible, and two-thirds of the circumference is snow-clad. The camera this dsy was left behind; indeed, the view was far too extensive to be realised by photography in any other way than by a series of panoramic views, and this was not in a tourist's power to execute.
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> * * * * * *
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> From Agra we made a flying visit to Cawnpore and Lucknow, and returned to Bengal on the very day month from that on which we started, with upwards of six dozen stereoscopic pictures and not a single spare glass.
>
> Many a pleasant half hour have I since spent in going over our tour in the stereoscope. Indeed one of the greatest pleasures a photographer has is the facility with which his pictures enable him to call vividly to recollection the scenes of his labours.
>
> In conclusion, I can only say, if any brother photographer should be induced to follow our example, and take a similar tour, my advice to him is, take double the time over it that we did; place no faith in the Indian rubber top of your bath; and, above all, don't forget your dark slide.

At the January meeting Mr. Jennings gave an interesting account of the magnesium light, and its photographic uses. He concluded his account of the light by appealing to Indian photography to secure, by its aid, the interiors, caves, mausoleums, temples, excavations, &c., with which India abounds. At the next meeting, a recipe for varnish was given, and highly recommended. We append the details, although it is not likely that many of our readers may need to experiment in its preparation:—

> Dissolve 2 oz. of *roomee mustogee*, a gum common in all bazaars, in 10 oz. of alcohol. By itself, I have found this somewhat too brittle, and I therefore add about half a bottle, say 2 oz. of French sœhnée varnish. The varnish filters readily through blotting paper. I use this varnish perfectly cold, and neither warm the plate before nor after application; it never chills, even in the wind, and will bear any sun in printing. If the plate is to be printed from immediately, it is better to let it dry in the sun; but I prefer myself to let it dry spontaneously, and not print from it for two or three days."

Mr. Schwartzschild then gave an account of his visit to the photo-sculpture studio in Paris, describing the results as very correct in likeness, but wanting in ideal beauty. Our readers will, doubtless, agree with us that photography in India, if beset with difficulties, is manifestly pursued with interest, and that the Bengal Photographic Society appears to be healthy and successful.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

The North London Medals—The Royal Cornwall Polytechnic Society's Awards—The Amateur Photographic Association's Prizes—The British Association—Opalotype Inventors—Raffaelle's Cartoons — The Societies.

A considerable portion of the photographic month has been occupied with a discussion on the award of medals at the North Eastern London Exhibition; it is therefore impossible, however reluctant I might be, not to devote a prolonged note of the "Echoes" to the same subject, and as everybody seems to think he has a "call" to speak out rather violently in this matter, I might be excused if I did the same, but which I will not if I can help it.

When people who have a profound conviction of their own worthiness fail to persuade others that they are as clever as they suppose themselves to be, cantankerousness is sure to prevail. And in this case the cause and the effect were unusually prominent, some disappointed exhibitors having been enthusiastically enraged. The readers of this Journal are aware that several medals were offered for competition in this exhibition, and that they were awarded, according to the best of their judgment, by five gentlemen who had been chosen by the North London Association as best qualified to judge. Amongst others there was a medal offered for the best camera or cameras; there were few contributors, and the medal was given to Mr. Meagher for what was considered the best designed camera exhibited. As this camera is in the possession of nearly every photographer who values good tools they can judge for themselves. This award coming to the knowledge of other exhibitors of apparatus they protested against the decision of the jurors, the reasons of one being that the exhibitor did not show his case on the same day as the others, which I believe was true; but how it could have been of any consequence, or how it could show collusion between the exhibitor and the jurors, as is suggested, I cannot discover. They then state that they themselves were better judges than the jurors, who knew nothing of cabinet work!—as if cabinet work was the chief merit in a camera—and that if the award of the medals had been left to themselves they should have awarded this medal to their own goods. Another exhibitor follows suit and "protests" likewise, but still more irrelevantly. Another exhibitor, who exhibits a few stereoscopes, thinking, I suppose, it would give him importance if he protested, also "protests."

It would be gross flattery to call these exhibitors humble. But this is not all—"there are pippins and cheese to come." As a relief to the others there *was* an humble exhibitor. Unlike the disappointed cabinet-makers, he thought he ought not to receive an award; therefore, before it had been officially offered to him, he magnanimously declined the honour of a medal!

"Folly lays many a trap—we can't escape it;
Nemo (says some one) *omnibus horis sapit.*"

The catalogue of the disappointed is not yet exhausted. The jury very wisely withheld the medal for the best enlargement, there being nothing in the exhibition worthy of the honour, and in their report they give very good reasons for their decision; but the disaffected argue that the medal should have been awarded, however bad the contributions. This would have been to reward—shall we say—mediocrity. The same arguments would apply, only more so, to the medal for the most artistic picture, which was withheld for reasons given in the report, and transferred to Mr. Blanchard for his instantaneous pictures. Some of Mr. Blanchard's good-natured friends have, for their own purposes, been endeavouring to persuade him that the jury have rewarded him for "capping his lens" quicker than others, and that they have slighted his art qualifications; but it appears to me that it must have been much more satisfactory to Mr. Blanchard to receive a medal for the instantaneous views for which he is so famous, and which, above all, are distinguishable for their art qualities, rather than for what, although highly meritorious pictures, could only be called an attempt at another branch of the art, which none but injudicious friends wouldendeavour to lead him to believe should have the medal.

One of the funny and foolish acts of almost all the malcontents has been to challenge the competency of the tribunal to which they had voluntarily appealed on exhibiting their contributions. The names of the jurors were announced, and the competitors anxiously courted their verdict. That verdict is given, and they forthwith commence to "rage and imagine a vain thing." A leading article in a daily paper, commenting on a similar after-thought in which the fitness of a tribunal is challenged simply because it has given an adverse verdict, says:—"People who lose suits are generally allowed to grumble and show their annoyance. The first question which arises upon this plea to the jurisdiction is, Why was it not thought of before? That a defendant should protest against the authority of a tribunal before which he is brought involuntarily is common enough; but who ever yet heard that a plaintiff, after voluntarily selecting his mode of arbitrament, should be allowed to turn round and protest against the authority to which he has submitted?"

If it were not that the object of the malcontents would be gained, and the photographic community would be deprived of some competent judges who are independent enough to do their duty, I should recommend the jurors never again to accept such a thankless task as they have just so honestly performed.

The Royal Cornwall Polytechnic Society have awarded their annual medals, and, as usual, have treated photographers very fairly. There was certainly one little difficulty which must have been an oversight of the judges. The case is this. A silver medal was awarded to Mr. W. H. Warner, of Ross, for landscapes, but they are catalogued as from negatives, the property of Mr. Grant; and it further appears that the negatives were taken by Mr. Restall, who has called attention to his own claims in the matter. The issue is at present uncertain. Mr. Warner claims the medal for printing and clouds. The courteous secretary, Mr. Hodges, has written to state that the medal must be withheld until the claim is better made out. The editor of this Journal, always conciliatory, suggests that a medal be given to both photographer and printer. I must confess that I don't like compromises in such matters. If the medal were awarded to the fine landscape, then he who selected that landscape, chose the point of view, the conditions of light, &c., and produced a fine negative of large size under the difficulties imposed on the photographer by locomotion in the Highlands, should surely receive the medal. If it were given for the "printing and clouds," and Mr. Warner is content with the doubtful honour, the decision might rest as it has already been made.

The managers of the Amateur Photographic Association have also awarded their prizes. This they have done in quite a liberal manner, the silver mugs, photographic albums, and certificates of honorable mention being very numerous; and it is to be hoped that all, including the "disappointed," are satisfied.

Those peripatetic philosophers—who collect all the sciences into one circle—the members of the British Association, held their annual festival at Birmingham this month. The meeting was remarkable for the number of gentlemen connected with photography present, and the absence of much matter of photographic interest. The magnesium light being the most brilliant, and Mr. Claudet's description of his arrangement of the Phenakitiscope the most scientific, and, I may add, the only, papers read before the Association in connection with our art-science. The wonderful variety of scientific topics, treated on by the different sections, reminds one that Captain Cuttle might have taken old Sol. Gills for the personification of the British Association when he, waving his hook towards the stock in trade in Sol. Gills' shop, said to the old instrument maker's nephew, "Wal'r, he's chock-full of science. Look'ye here! Here's a collection of 'em. Earth, air, or water. It's all one. Only say where you'll have it. Up in a balloon? There you are. Down in a bell? There you are. D'ye want to put the North Star in a pair of scales and weigh it? He'll do it for you."

One of the numerous inventors of opalotypes who are now starting up, gives the following singular reason for keeping his process a secret:—"The reason why I wish to keep this process to myself, or to sell it only to responsible parties, is that photographers in general are not the most conscientious of men, and are very much given to underselling each other; so that, if I published my process, in a very short time it would not pay me to produce these pictures any longer." I don't quite understand this reasoning, but I am sure no photographer will believe that he is not conscientious, and it is of really no consequence who keeps processes of this nature secret now the Simpsontype has been so well described, and which has succeeded so admirably in the hands of almost all those who have tried it.

It seems impossible that the "outside press" will ever understand photography. Here is a curious example. Seven years ago, the cartoons of Raphael were photographed by Messrs. Caldesi and Montecchi, and the *Standard* has just discovered that it is time to review them, which they have done in a recent number. In doing so they give the most astonishing reason for the copying being well done I ever heard. Here it is:—"We might surmise that much of the excellence in the photographs is due to the fact that the photographers are Italians and well acquainted with the Roman manner of design, familiar possibly with the process of building up a cartoon, so to speak, through all its stages, and appreciating, moreover, those broad masses of light and shade so essential to paintings intended to cover large spaces in public buildings."

Apart from the absurdity of the idea that a knowledge of "the Roman manner of design" was necessary in making plain copies of very easy subjects, it is a curious fact, that most of them were made by an English assistant. Another extract from the same review might be interesting. "The difficulties at first seemed insurmountable. The pictures were not only not easy of access, but the eye had some trouble to penetrate the darkness which shrouded them like a veil." The simple truth is that they were removed from the gallery in which they were kept, into the courtyard of Hampton Court Palace, and photographed in the sun. They were removed, in the first place, at the instance of the authorities of the South Kensington Museum, to enable Mr. Thurston Thompson to make those magnificent copies now used in the Government schools of art, and Messrs. Caldesi and Montecchi obtained permission to photograph them at the same time. It is right that the real facts of the production of perhaps the only photographic copies that can ever be made of Raphael's Cartoons should be put on record.

The societies are again commencing their meetings for the season. The Liverpool Amateur Association commenced their session with a paper by Mr. Sayce, on his important new process,—"Photography without a nitrate of silver bath." Some specimens of this process that I have seen were quite equal to anything ever done with ordinary wet collodion, and had not that peculiar effect which is inseparable from pictures taken with the other dry processes. At the same meeting Mr. G. F. Williams detailed some experiments he had made with collodio-chloride of silver for paper printing, and he gave what he thought the best formulæ for its manufacture, which did not seem to vary from that originally suggested by its inventor, Mr. Wharton Simpson.

At the Edinburgh Photographic Society Mr. Chapman exhibited what is described as a new camera for working wet plates in the fields without a tent. This camera contains all the necessary baths in its body, and appears to be a modification of Archer's original contrivance for this purpose, and which was superseded by the more cumbrous but much more effective tent.

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THE SCIENCE OF A RAY OF LIGHT.

BY PROF. TOWLER.[*]

Refraction.

Although photographs can be and have been taken by means of reflecting surfaces, such as concave mirrors, and taken, too, with the utmost accuracy, catoptric instruments will rarely if ever be used by the ordinary photographer. On this account, the articles that have already appeared in this and the foreign journals on the subject of optics, embracing as they did an analysis of the laws of reflection of light, will be less interesting to our readers than the one which now engages our attention, namely, *Refraction* of light.

We will endeavour to render the science of this subject as simple as possible. *Refraction* signifies, in plain Saxon or English roots, *breaking back.*

A ray of light is *broken back* from its course whenever it passes from one medium into another of *different density*, and when the surface of the latter is *not perpendicular* to that course. The intelligent physicist will perceive that we treat a ray of light as a material object; we prefer to do so, disregarding the undulatory theory entirely on the present occasion, in order to render the subject intelligible to those whose means of acquiring scientific truths have been limited.

With this view of a ray of light—that is, regarding this ray as produced by a *solid ball* of matter cleaving its way through space—let us compare the results produced by the passage of elastic balls through media, and their impact on other media of different density.

Let a steel ball fall from a distance of three or four feet upon a marble slab, for instance, placed horizontally below. The course of the ball will be perpendicular to the slab.

What is the result? What do you observe?

The ball, after it strikes the slab, is *turned back* on its original course, and rises nearly to the point from which it started.

Let the ball fall from a great distance with the uniform velocity which it then acquires of about seven miles per second of time, or let it be projected from a rifle in the same direction; what is the result?

In this case the ball is not turned back; it passes through the marble slab slower, it is true, than before, but still in the same direction.

Let the ball fall separately upon mercury, sulphuric acid, water, and air, and observe its velocity for the first second of time through either of these media; the space moved over in each case will decrease as the density increases, being about sixteen feet through air, and much less through mercury.

If the ball were projected with a very great velocity through these media, the velocity in each medium would naturally be increased, but the ratio or proportion would remain the same.

Instead, however, in all the preceding cases, of allowing the ball to impinge perpendicularly upon the surface, let it fall or be projected obliquely to this surface, and observe the results.

In each and all of these cases the direction of the ball is *broken back* (refracted), this breaking of the direction taking place the moment it touches the different medium; but afterwards the ball moves in a straight direction when once within the medium. This is the first observation.

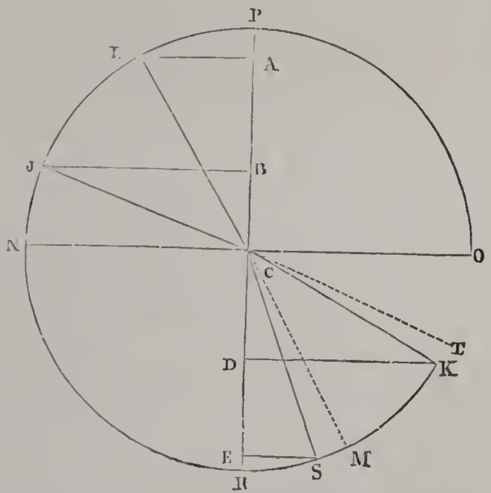
Secondly, we observe that the ball is broken *downwards towards* a perpendicular at the point of impact when the medium is *more dense* than the one through which it previously moved; and *upwards* from the perpendicular if the medium be *less dense.*

Thirdly, it is furthermore observed that if a plane surface, such as that of a board, be erected perpendicular to the surface of the medium, and that the ball, as before, fall or be projected obliquely along the plane until it impinge upon the medium, its direction, although broken, will continue along the plane within the medium.

Fourthly, it has been proved by experiment that the *amount of breaking* (that is, the difference between the angle of direction with the perpendicular before the ball enters the medium and that with the same perpendicular as it moves in the medium) depends upon the difference in the densities of the two media.

Finally, if, with the same medium, the ball be projected or allowed to fall at different degrees of obliquity, there is no discoverable law between the angles of incidence and emergence, that is, they are not in proportion; thus, if A and B represent two angles of incidence, and *a* and *b* the corresponding angles of emergence, the proportion that A is to B as *a* is to *b* does not exist; and consequently A divided by *a* is not equal to B divided by *b;* but the following *remarkable ratio* is found to exist between the sines of the angles and incidence.

You must learn first what is meant by the sines of angles. Draw the circle NPOR from the centre C and radius CP;



draw also the diameter NO horizontally and PR perpendicular to it. The opening or angle PCO or OCR, etc., is right angle containing the fourth part of a circle (36 degrees), and is equal, therefore, to 90 degrees. Let th space in the circle above the diameter NO represent air whilst the space below is water.

If, now, the ball be projected upon the water in the direction LC, this direction will be broken at C towards the normal or PR, so as to assume a new direction, CS, instead of the original course, CM; again, let the ball be projected at a different angle of obliquity, as, for instance, in the direction JC; this direction will in like manner be broken at the point of impact, C, out of the original course, CT, now taking the course CK.

From the extremities of the radii, LC, JC, KC, and SC, draw the lines LA, JB, KD, and SE respectively perpendicular to the diameter, PR, and consequently parallel to NO.

The angle LCP is denominated the angle of incidence of the direction SC; the line LA is the *sine* of this angle; the line CS, broken *nearer* to the perpendicular CR, because the medium below NO is more dense than that above, is denominated the emergent or refracted direction or course; SCR is the angle of refraction, whilst the line SE is the sine of this angle.

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[*] From *Humphrey's Journal.* Continued from p. 426, vol. viii,

JC and CK are respectively the incidental and emergent or refracted directions of the ball at the corresponding angles JCP of incidence and KCR of refraction, whilst JB is the sine of the angle of incidence, and KD is the sine of the angle of refraction.

As we said before, the proportion:

$$LCP : SCR :: JCB : KCR$$

is not valid—does not exist; but the following proportion always exists:—

$$\text{Sine of } LCP : \text{sine of } SCR : \text{sine of } JCB : \text{Sine of } KCR.$$

In other words, taking the lines that represent these sines, the proportion stands as follows:—

$$LA : SE :: JB : DK.$$

From the general qualities of proportion we derive the following equations:—

$$LA \div SE = JB \div DK\text{; or, } SE \div LA = DK \div JB$$

Now the quotient arising by dividing one number by another is called also the ratio of these numbers; hence the ratio of SE to LA is equal to the ratio of DK to JB.

A knowledge of this ratio is of the utmost importance if you wish to understand hereafter our further instructions in reference to the magnifying property of lenses, as also of the property which they possess of producing images on the ground glass or collodion film.

The difference between the angle of incidence and refraction is denominated the *angle of deviation*; thus the angle SCM in one instance, and the angle KCT in the other, are respectively the angle of deviation of the directions LC and JC when broken at C.

All that has just been said in reference to an elastic steel ball, of whatever size it may be, whether infinitely large or small, is valid in reference to light, a ray of light, an infinitely small atom of light. This atom of light has a much greater velocity than any ball of ordinary matter gravitating from an infinite distance towards the earth. The velocity of light, as determined by two distinct and independent methods, is 192,000 miles in a second of time; but the greatest velocity that a ball could attain under the circumstances in question is somewhat less than seven miles (6.95 miles).

Conceiving, therefore, to aid description, infinitely small atoms of matter endowed with the inconceivable velocity of nearly two hundred thousand miles per second, is it any longer wonderful that light is so penetrating as to cleave itself a passage through hard flint rock? Many of the properties of light, such as those of reflection, refraction, polarization, etc., can be beautifully explained by considering light material, whilst other properties remain unexplained under this consideration. Such as can be so explained will be thus popularized to the great offence of the theorists.

We will now sum up the instruction given in this article.

1. The angle of incidence is the angle comprehended between the direction of a ray of light and a perpendicular or normal at the point where the ray falls or impinges on a surface.

2. The angle of refraction is the angle comprehended between the direction of the ray after it has been broken and the same perpendicular, as before, continued through the point of refraction.

3. The angle of deviation is the difference between the two preceding angles.

4. The refracted ray is nearer to the perpendicular than the incidental ray when the medium that refracts it is more dense, and *vice versâ*.

5. The incidental and refracted rays are in the same plane.

6. There is a constant ratio between the *sines* of the angles of incidence and refraction.

7. Refraction is the cause of the magnifying power of lenses, and of the property they possess of producing luminous images of objects.

(*To be continued.*)

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PHOTOGRAPHY AT THE DUBLIN EXHIBITION.

Report and Awards of the Jurors.

The following Report has been issued by the Jurors of Class F.—Fine Arts (Photography), in the International Exhibition at Dublin:—

The department of Photography at the International Exhibition of Dublin, as might be expected from the geographical position of that city, does not exhibit so complete a representation of the art as could be wished. Many photographers of reputation in England, France, Germany, America, and other countries, are wanting; and this deficiency is the more observed when we recollect the great display of photography at the International Exhibition of 1862, and the splendid specimens there collected from all parts of the world. We must, however, bear in mind that photography had then attained a very high state of perfection, and that it was not to be expected it could, in so short a period as three years, show any very great advance. Nevertheless, under all disadvantages, it must be admitted that the display is successful.

The Photographic Department has been well organized; spacious rooms of an easy access have been devoted to the display of the specimens. The only thing to be regretted is the want of top light, without which no picture can be shown to advantage, and especially photographs, which are generally taken either in open air or under skylights, with light from above. As a rule, pictures should be viewed with the light in the same direction as that in which they are produced or painted; otherwise there is something false and unnatural in the effect. For this reason photographs, being nearly always taken with the light more above than under an angle of 45°, should be exhibited under top lights.

Notwithstanding these somewhat hypercritical remarks, made for the sake of a better arrangement in future exhibitions, the public has had a very good opportunity of examining and comparing the merits of all the various specimens exhibited, including some interesting new processes introduced in the art since the Exhibition of 1862.

These new processes are—the Wothlytype, the developing by formic acid, the Simpsontype, the casket portraits, photosculpture, and carbon processes. These new discoveries have given to the Dublin Exhibition a character of great interest, and go far to compensate for many of its unavoidable deficiencies. The absence of many English and foreign photographers of reputation is apparent from the deficiency of artistic character, particularly in portraiture, though, of course, there are brilliant exceptions; and we call attention to this with the desire of pointing out to photographers how essential is this quality, and that without it photographic portraiture cannot obtain the support of the well educated part of the community, and deserve the encouragement of those who, by their studies and artistic instruction, generally lead the taste of the public. In portraiture the aim should be not only to produce well-defined, clear, and good photographs, but to give to the sitter a natural *pose*, without vulgarity; to arrange the draperies with taste; to avoid unnecessary and incongruous accessories, and so to light the subject that the features and countenance will be brought out in the most favourable way. We are especially led to these remarks by the examination of a number of portraits and groups exhibited by Mrs. Cameron, which—although as photographs are very indifferent, arising, possibly, from the want of first-rate apparatus, a sufficient experience in manipulation, or from other causes—are the works of a true artist. There is no experienced judge who would not prefer these productions, with their manifest imperfections, to many of the best manipulated photographic portraits which are to be seen in the exhibition.

The more Mrs. Cameron's productions are examined, the more they are appreciated. At first sight they may be neglected and misunderstood, but at a second and third visit her frames are those which at once attract attention.

That composition is the main quality in photographic portraiture, and that mechanical skill and artistic taste may be united with it, is well exemplified in the portraits and groups exhibited to which medals are awarded. In addition to those selected for award of medals, the studies by the late Viscountess Hawarden are worthy of the highest commendation. The jury feel sensibly the loss which the photographic art has sustained in the death of so accomplished an artist, and regret that they are thus prevented from marking their sense of the merit of Lady Hawarden's pictures by the award of a medal.

A cursory inspection of a number of photographic portraits will generally enable a correct judgment to be formed how far the operator is a person of taste and refinement, and has had artistic training. Such men never exhibit what is deficient in effect and composition; and as they cannot always be successful, they have the good sense to know their failures, and they reject or destroy every negative, however perfect it may be as a photograph, if the artistic effect and composition are not completely satisfactory.

There is another point which, though not strictly connected with photography, calls for observation. We allude to the mounting and frames in which photographs are frequently exhibited. Here again the true artist may be detected by his choice in this direction. When photographs are surrounded by gaudy borders, strange devices, inartistic ornaments, and discordant colours, it can scarcely be expected that they have been produced by operators of sound taste; and when examined it will assuredly turn out that they exhibit more or less incongruity or irregularity in the *pose* and composition. These remarks have been called forth by the display of too many of this class of mounting and frames in the present exhibition.

The choice of the subjects for exhibition is another test of the artistic training and natural disposition of the operator. The portraits exhibited should be of eminent persons, in whom the public take an interest, the principal merit in such an exhibition being its historical and instructive character; or they should be selected as illustrations of beauty of features and excellence of form. A photographer who exhibits productions without reference to these conditions, however perfect they may be as the result of manipulation, lowers the art he is practising, and shows that he is not an artist.

In many cases frames are exhibited containing one or two dozen of portraits, without any care or reason for their selection, and the exhibitor would have better served his interest and his reputation had he chosen out of that number two or three specimens and rejected all the others.

The same remark may be made respecting the reproductions of landscapes, buildings, and views of ancient and modern architecture. None should be exhibited if the subject has nothing to make it interesting. The subject chosen by the photographer is the surest criterion of his feeling and taste, and in exhibiting pictures which please the eye and elevate the mind he ennobles the art he is practising. The *desideratum* for a photographer is to know when he has succeeded in producing a satisfactory result—and this, it appears, is not so easy a matter.

It is not to be supposed that such men as Bedford, Maxwell Lyte, Mudd, England, Heath, and others, have never failed in their attempts. But they have had the judgment and good taste never to exhibit a picture which is not remarkable in some of the qualities which distinguish the true works of art. When we examine the specimens exhibited by such artists we cannot but acknowledge their excellence, that they do the greatest honour to photography, and are capable of elevating it to the rank of fine art. Vulgarity and absence of taste have been the greatest enemies of photography, and, if not checked in time, will degrade the art and cause the decadence of that marvellous discovery of which there appear already too many signs.

Landscapes, mountain and sea views, architectural subjects, ancient and modern, all these are a field which cannot be worked out except by those who understand the beautiful. The mere choice of the subject, the moment at which it is to be represented, when the effects of light are the most favourable, require the eyes and feeling of artists. In their hands photography is only the means of catching the picture they have selected, to represent nature in some point of beauty. For this, they must, of course, make use of perfect instruments, and manipulate well; but the principal merit of their works is due to the selection of the subject, and to the treatment of its reproduction.

The enlargement of photographs has been illustrated by some good specimens, but they are generally deficient in the choice of models. It is especially important in this class of works, that the operator should choose pleasing subjects which might induce the public to encourage this branch of the art, and serve as studies to the painters. There are features which ought never to be enlarged to the size of nature by the process of photography. Enlargements may be usefully employed by clever painters, who, in preserving the likeness and the true proportions of the features which they have for their guide, are capable of imparting to the picture the refinements of art, and thus produce a pleasing likeness from an unpleasing photograph. As mere photographs, enlargements of portraits will rarely be pleasing, and are not suitable for exhibition to the uninitiated public.

Among the examples of enlargements there are two series of this kind of production from the same negative, enlarged from its small size, in various proportions, gradually increased. They are all beautifully defined and well executed, showing great skill in the photographic manipulation. These enlargements, performed by the solar camera of Dr. Von Monckhoven, have been produced and exhibited by Mr. Mayall. They show the great perfection of this improved apparatus.

The specimens of rapidly taken portraits of children, produced by the means of *formic acid* developer are bright and clear, and prove that the negatives made by this new developer have all the qualities of the best ordinary modes of development. This is exemplified by a number of instantaneous portraits of babies and groups of children, exhibited among the contributions of Mr. Claudet. His son, Mr. Henri Claudet, by a proper combination of other substances with formic acid, has brought out in all its force the developing power of this acid, the employment of which as a photographic agent had originally been suggested by Mr. Maxwell Lyte, and he has liberally published his formula in the *Journal of the Photographic Society*, so that every photographer can avail himself of its advantages.

Mr. Wharton Simpson, well known for his scientific researches in photography, and his unflinching devotion to the art, actuated by the same honourable feeling, has also published, through the Photographic Society, his very interesting discovery of a process called *Simpsontype*, which has introduced great simplicity in the manipulation, and which, for this reason, will be very useful to the amateur as well as professional photographer. The specimens shown are very effective and perfect, and a medal has been awarded to him.

Swan's carbon process is deserving of high commendation, and is a step in the right direction; and the jury desire to mark their sense of its importance by the award of a medal.

The *Wothlytype*, invented by Mr. Wothly, a German photographer, is another recent process which would be a great acquisition to the art of photography, if it should turn out, as announced, that the substances employed in its manipulation are less expensive, the manipulation more simple, and that the pictures printed by this means are less liable to fade than when produced by the usual process. However, of this last merit time alone can decide. A number of specimens, produced by the Wothlytype, have been exhibited, produced by the United Association of Photography. Their effect is generally good, but, as much as can be judged from their appearance, they are far from presenting any sign of stability, or any quality of superiority over the old process. Nevertheless, the discovery made by Mr. Wothly is an important step in the road of progress, and, with the improvements which experience only can suggest, it may become very useful.

Photographic portraits and views of caves and caverns, obtained by means of the magnesium light, have been produced and contributed by Messrs. Brothers, of Manchester.

Although, except in the polar regions, where the sun is invisible during a great part of the year, there seems to be no advantage in taking portraits by artificial light, but, on the contrary, expense, difficulty, and absence of all artistic effect, still it is highly interesting that we should be able to obtain by these means views of places where the light of the day can never penetrate; and on this account photographers who endeavour to master the process of magnesium light, and to improve the instruments employed, deserve to be encouraged for their exertions and ingenuity. The portraits taken by the magnesium light, by Messrs. Brothers, are very good, considering all the difficulties they have had to overcome. They may, at all events, show the great power of that light, and, for this reason, they illustrate a very interesting scientific experiment.

One of the most curious novelties in the photographic exhibition is the production of what is called *casket portraits*, specimens of which are contributed by Mr. Swan, the inventor. For such a really ingenious, original, and scientific contrivance, it seems that the author might have found a more appropriate name, designating more properly the principles upon which it is based, and the manner of its construction. It is, in fact, neither more nor less than a real stereoscope, in a different form from that well-known instrument.

Without being conscious of it, the observer has before his eyes, as in the ordinary stereoscope, a picture composed of two different photographs superposed, each one separately visible to one eye and invisible to the other. These two pictures, placed at right-angles on the two sides of two rectangular prisms, with their hypothenuses in contact, forming a quadrangular block of glass, are covered to the eye, one from the back surface by refraction, and the other from its hypothenuse by reflection, after having been refracted upon it by the other prism. By the optical law of the angle of incidence and reflection the reflected image is seen only by one eye, the axis of which coincides with the reflected ray, and is invisible to the other eye; and by the law of refraction the other image is seen only by the eye, the axis of which coincides with the refracted ray, and is invisible to the other. So that when the observer is placed exactly in the position from which each eye has the exclusive perception of the image, whose perspective belongs thereto, the two images coalesce on the two retinæ, and the stereoscopic perception is brought out in all its beauty and force. The only defect of the apparatus is, that the observer is obliged to find the exact position from which the phenomenon takes place exclusively, and if he lose that position, by the slightest movement of the head, he sees only one or the other image, and there is no illusion of relief, the picture having the flatness of the single photograph which represents it. Notwithstanding that imperfection, Mr. Swan has succeeded in contriving a most ingenious instrument, which elegantly illustrates a very extraordinary phenomenon of optics.

In coloured photographs Messrs. Lock and Whitfield stand deservedly at the head of this branch of the art; the portraits exhibited by these gentlemen display a high degree of artistic execution and skill in selection of *pose* and treatment.

Among the interesting objects for the delineation of which photography has been applied, the jury desire to notice the views, taken by the Countess of Ross, of Lord Ross's Great Telescope and its arrangements.

The Photographic Exhibition of Dublin has had the advantage of bringing before the public a new applicaton of photography, consisting in the process known as *Photosculpture*. A number of busts and statuettes, illustrating the process, have been exhibited by the International Photosculpture Company. The inventor, M. Villeine,* an eminent French sculptor, having first tried to avail himself of such photographs as he could procure as a guide when modelling, was struck with the idea that if, instead of only one portrait, he had a great number of photographs, representing the person all round from every point of view, he might use them each in turn to shape his model by means of a pantograph, one point of which could follow consecutively the outlines of each photograph sufficiently enlarged, while the other point of the pantograph would transfer, in any reduced scale desired, the same outlines on the block of clay.

The sitter being placed in the middle of a glass room, surrounded by twenty-four cameras, all operating at once, as many photographs can be taken at once in a few seconds. M. Villeine considered that thus he had all that he wanted to transform his block of clay into a perfect plastic representation of the features, forms, and character of the person, and this work being done, he had only to smooth down the roughness of the various cuttings, and to communicate to the model all the refinement which his skill as a sculptor could suggest. The result, as is shown by the specimens exhibited, has proved the merit and the power of the invention. Photosculpture must be hailed as one of the most useful and noblest applications of photography, and it is destined to spread the taste for sculpture, which is now confined to a very limited number of highly educated minds in the higher classes of society. Photography has received another beautiful and useful application by the process invented and practised by M. Lafon de Camarsac. Some specimens are exhibited by M. Silvy, a photographer distinguished by his artistic taste. One of them is from a photographic negative taken by M. Silvy, representing a group of a great number of distinguished persons, including some members of the Royal Family of England and the ex-Royal Family of France, at the fête champêtre given last year at Orleans' House, in aid of the fund of the "Société française de Bienfaisance."

Photography on enamel presents many advantages; the pictures being burnt in or fixed by the action of fire, like metallic colours on porcelain or glass, are not liable to fading like photographs on paper, and they may form ornaments to be worn by ladies, or placed in cabinets or on tables in the drawing-room, as they are indestructible, except by breaking. As enamels they may be painted in colours, also burnt in and unalterable, and resemble the finest miniature on ivory. Those who have had the opportunity of admiring, at the Kensington Exhibition, the beautiful collection of enamels painted by old and modern artists, will be glad to know that photographic portraits may be transformed into similar indestructible and splendid miniatures by living painters, who have only to impart to the photograph the natural colours, with all the refinement which their skill may suggest, will produce the most valuable and perfect works of art.

There has been at the Dublin Exhibition a deficiency of instantaneous stereoscopic productions, such as those which were exhibited at the International Exhibition of 1862 by Messrs. Ferrier and Soulier, by Mr. Wilson and others, the effect of which was so beautiful and extraordinary. It is to be regretted that this class of photographs has not been largely represented; however, there has been enough shown to illustrate the capabilities of instantaneous photography. Mr. Breese has exhibited his marvellous effects of moonlight, sea, and cloud scenery. Nothing can more fully express the instantaneity of Mr. Breese's process than his having been able to represent the waves of the sea during their rapid rolling motion in curling form with spray, suspended in the air, and falling in vapour, while sea gulls are seen flying above, watching for their prey. In looking at such marvellous pictures we feel transported, as by magic, before the actual scenes, and the illusion of reality is irresistibly impressed on the mind. The means employed by Mr. Breese to produce these combined effects show great ingenuity, patience, and a considerable amount of artistic taste, for no one with a knowledge of photography can for a moment imagine that the sea or landscape has been taken simultaneously when only lighted by the moon, which is represented above. To produce such effects with the light of the moon would require a photographic preparation two or three hundred thousand times more sensitive than any process known. The moon itself can produce its own image, because, lighted in the same degree by the sun, it reflects a light as intense as ordinary clouds in the day time, which clouds operate instantaneously.

Micro-photography has also been represented by the frames exhibited in the English Department by Dr. Maddox (92), showing some very well defined tests considerably magnified. M. Duvette (122), in the French Department, shows some very good specimens; and particularly, a remarkable one of a flea enlarged, piecemeal, many thousand times.

Mr. Dagron also has exhibited some beautiful specimens of micro-photography; they are mounted at one end of a very small cylinder of glass, the other end of which is ground like a microscopic lens, generally called the Stanhope lens, but of which Sir David Brewster claims the invention. The tube is about one-quarter of an inch long, its diameter one-sixteenth of an inch. It is wonderful to think that this constitutes a microscope, with its lens at one end and the photograph at the other end. Although this photograph is imperceptible to the naked eye, still, by looking at it through the minute microscope, we see the portrait of a person as large as nature; a page of the Bible we can read as easily as in the book. This minute optical instrument, with its imperceptible photograph, can be mounted in rings, watch-keys, pin, or any other small ornaments. The productions of M. Dagron are a very charming and wonderful combination of photography and microscopy, in which he has seen his way to a considerable branch of manufacture; and for this object he has formed a large establishment in which, by a well-organized division of labour, by well-combined machinery, everything is done on the spot—taking the large photograph, reducing to the microscopic size, manufacturing the small microscope, mounting the picture, making the articles of jewellery themselves. M. Dagron has exhibited the instrument by which he can reduce any photograph to the microscopic size, and by which he can produce at once, upon a collodion plate of about three inches by three inches, twenty-five or thirty microscopic pictures. The pictures are afterwards divided by a cutting diamond, ground in disks, and fixed at the end of the small microscope. The whole process is very rapid, simple, and ingenious, and so well constructed that the microscope, with its photograph, can be sold as low as twelve shillings per dozen, ready to be mounted by the jeweller in any kind of trinket or ornament.

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* This should be M. Willemm.—Ed.

At the suggestion of Sir David Brewster, M. Dagron has produced stereoscopic pictures, and mounted them at the two ends of the gold bar by which a watch chain is held in the buttonhole of the waistcoat. The gold bar is no longer than two inches, and it may be extended by a sliding tube to two and a half, to suit any separation of the eyes. The idea of a microscopic-stereoscope is very curious.

It is satisfactory to see that photography is extending its ramifications to the remotest parts of the world, and that the English colonies have furnished some very good contributions to the Dublin Exhibition. Such productions have a double interest; they show that photography is appreciated and encouraged in these far regions, and that this offspring of science is following civilization everywhere; besides, it brings to us faithful representations of countries which only few have had, and will ever have, the opportunity of visiting. Photography alone can illustrate with truth the descriptive records of travellers, giving to us the history of the progress of the colonies which the old world is establishing in every part of our globe for the improvement, enterprise, and development of the human race.

The Dublin Exhibition affords a very interesting and manifest proof of all the advantages and merits of photography, and shows that the new art has become the indespensable auxiliary of both art and manufactures in furnishing the illustrations of all their productions. There is hardly a department of the Exhibition in which the exhibitors have not availed themselves of photography to represent the articles they exhibit or the instruments by which they are made. But it is particularly in the Department of Machinery that photography has rendered eminent services in showing the mode of their production and their various applications. A remarkable example of such illustrations is seen in the Prussian Department, showing the machines under their various aspects, and the extensive works in which they have been manufactured, with the appliances which have been used in their construction.

Thus the exhibition of photography has not been confined to the particular department which has been devoted to it, it has, indeed, invaded the whole of the elegant palace, being, in fact, the indispensable adjunct of every specimen of art and manufactures from all parts of the world.

Not only the contents of the Exhibition have been reproduced by photography, but the palace itself, in all its most elegant and picturesque aspects, has been represented in photographs executed by the Stereoscopic Company. The beautiful stereoscopic views taken by that spirited association will remain for a long time interesting subjects of observation, and afford a pleasing recollection of the International Exhibition of Dublin, 1865. It will enable those who have been deprived of visiting it personally to see it in all its actual reality.

In conclusion, it is a great satisfaction to state that photography, on the whole, has been well represented at the Dublin Exhibition, forming one of its most conspicuous and interesting features; this will be a source of congratulation to the photographic exhibitors in general, a cause of encouragement to its devotees, and a helpful impulse in the right direction, giving the hopes of still more glorious successes in future exhibitions.

A. CLAUDET.
P. LE NEVE FOSTER.

LIST OF AWARDS.—MEDALS.

UNITED KINGDOM.

14. The London Stereoscopic Company, 53, Cheapside, London.—For good manipulation, and great variety in their productions.

26 & 68. Ross, J. E., 90, Princes Street, Edinburgh.—For artistic feeling in the pose, particularly of children.

36 & 77. Rejlander, O. G., 129, Maldon Road, London.—For excellence of artistic composition.

46. Mawson & Swan, 9, Mosley Street, Newcastle-on-Tyne.—For Swan's carbon printing process.

47. Lock & Whitfield, 178, Regent-street, London.—For great artistic merit in their painted photographs.

49 & 108. Robinson, H. P., Leamington.—For excellence in his manipulation, and artistic effects.

51. International Photosculpture Company, Old Broad Street, London.—For the excellence of their productions, obtained by means of Villeine's process of photosculpture.

52. Casket-Portrait Company, 40, Charing Cross, London.—For the ingenious optical arrangement for producing stereoscopic effect.

64. Jocelyn, Viscountess.—Excellence in manipulation, and selection of artistic subjects.

79. Amateur Photographic Association, 12, York Place, London, W.—For the pictures by Major Gresley, Earl of Caithness, Dr. Hemphill, Mr. Chidson, and for "Caryatides."

81. Caithness, Earl of, 17, Hill Street, London, W.—For his good manipulation, and artistic choice of subjects.

83. Heath, Vernon, 43, Piccadilly, London.—For excellence in manipulation, and artistic choice of subjects.

89. Hemphill, W. D., M.D., Clonmel.—For excellence in manipulation, and artistic choice of subjects.

92. Maddox, Dr., 2, Foster Lane, London, E.C.—For excellence in his microscopic reproductions.

106. Bedford, F., 326, Camden Road, London.—For excellence in his manipulation, and artistic effects.

107. England, W., 7, St. James's Square, Notting Hill, London, W.—For excellence in his manipulation, and artistic effect.

111. Mudd, J., 10, St. Ann's Square, Manchester.—For excellence of manipulation, and artistic selection of subjects taken by the collodio-albumen process.

112 & 126. Thompson, Thurston, Camden Hill, London, W.—For excellence in his reproductions of Turner's pictures.

113. Breese, C. S., Acock's Green, Birmingham.—For excellence of manipulation, and artistic effects in transparent photographs, and for his very ingenious combination printing.

123. Joubert, F., Porchester Terrace, London, W.—For excellence in his reproductions of paintings.

148. Russell, Major.—For pictures illustrative of experiments in reference to the use of bromides in the dry process.

160. Bourne.—For excellence of manipulation, and choice of Indian subjects.

Simpson, G. Wharton, 36, Canonbury Park, London, N.—For his collodio-chloride printing process.

124. Blanchard, V., Camden Cottages, London, N.W.—For good manipulation, and artistic excellence.

23. Mayall, J. E., 224, Regent Street, London, W.—For a series of pictures illustrating various degrees of enlargements, and for his skilful manipulation.

94. Rough, W. W., 180, Strand, London, W.C.—For artistic excellence and good manipulation.

From the Report of the Jurors on Philosophical and Photographic Instruments we make the following extract:—

We have not found in the present exhibition a large or very varied collection of Philosophical Apparatus, but we are able to report that some of the objects submitted to us are of unusual merit. We would especially direct attention to the unrivalled photographic lenses exhibited by Mr. J. H. Dallmeyer; and more particularly to a new triple meniscus, by which a landscape subtending at the camera as wide an angle as 70°, can be photographed with extraordinary fidelity, though not free from distortion; and to another combination producing more limited pictures, which are in a very remarkable degree free from distortion, and of great and equable beauty throughout their whole extent.

Award 292. Dallmeyer, J. H., 19, Bloomsbury-street, London, W.C.—For photographic lenses and especially for his wide-angle landscape lens, and his triple achromatic lens free from distortion; and Honourable Mention for his photographic cameras, portable telescopes, and tripod table stand.

Notices of Certificates of "Honourable Mention" in our next.

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Correspondence.

THE NEW METHOD OF PRESS PRINTING.

Sir,—You have selected a most unfortunate illustration in your argument on "patent law and inventors" in the last News. Unfortunate for your argument, unfortunate for me, because it compels me to perform a most unpleasant duty, to write of myself in assertion of rights which I trusted you would have been the first to defend.

In the article referred to, you define my position in regard to the publication of the new system of press-printing. I am represented as the inventor who keeps the secret of his invention to the public disadvantage. You say, "Mr. Swan exercised his abstract right to preserve his secret, and, so far, the community derived nothing from its existence."

In making this statement, you must have forgotten that it was through yourself, as my spokesman, that the process was first given to the public..

You are also aware that I consented to your publication of my ideas on the subject, although understanding that these did not form part of Mr. Woodbury's patent, and therefore, independently of that or any patent, the public would have become possessed of my invention—indeed, *have* become possessed of it. For I hold (and I think that any unbiassed and careful reader of Mr. Woodbury's specification cannot fail to see) that my idea of the new system of printing, as described in your article of October 14, 1864, is not contained in Mr. Woodbury's patent. That exposition was a very clear communication of the ideas which I had communicated to you. I had had several conversations with you on the subject, and, with the fervour of an inventor, had sought to impress you with the greatness and value of my idea. It was no "crude idea" with me, but one carefully thought out and practically demonstrated. At the time of your writing the article referred to, you say that Mr. Woodbury did "not regard the principle as capable of very successful application." It is evident, therefore, that you did not derive your inspiration from *him*.

Thus, contrary to your statement that I preserved my secret, not only did I give the idea through you to the public, but I also prosecuted the invention, and am still prosecuting it to its practical results, and in due time I trust the public will reap the advantage of my labours. I am glad to say, too, that recently I have made some very important improvements in the details of the process, which considerably enhance its practical value.

In reference to your statement that Mr. Woodbury "made an independent discovery of the same idea, and patented it at once," allow me to say, that I am most unwilling to utter a word that would be injurious to the interests of Mr. Woodbury in connection with his patent. I am a patentee myself, and a believer in the utility and right principle of patents; but at the same time, I believe that it is not the interest of a patentee to have false notions about his patent, and I think, too, that a good patent will not be in the least injured by the public discussion of its merits. Nevertheless, I assure you, that it is most painful to me to have to say a word on the subject of this patent. But how can I possibly escape the necessity? You have left me no other way of escape than by giving up my right to the use of my own invention, and my allowing a very erroneous idea to obtain public currency. As you have put the case, it is an unavoidable necessity with me to show the real nature of Mr. Woodbury's patent, and how far from correct your statement is that Mr. Woodbury patented the invention of the new process of printing.

I will first refer to Mr. Woodbury's provisional specification, entered at the Patent Office, Sept. 23, 1864; that is, just prior to the publication of the new process in the News. A point in your argument is, that patenting involves publicity. We must then expect to find a clear statement of the nature of the patentee's invention in this specification. We are entitled to look for this even in the provisional specification; in this instance more particularly, because the idea of the invention is, as you yourself show, a new and clearly defined idea, and capable of very distinct exposition. Moreover, if it be correct, as you say, that Mr. Woodbury patented the idea at once, we must find it in his first or provisional specification; and if we cannot find it there, I think it will be evident that he did not originally intend that his patent should apply to this new process of printing; and if he did not originally intend this, then I submit that it would be most unfair towards me, a public wrong, and greatly against the justice or value of patents, if it were allowed that a large and valuable idea like this, publicly announced in the interim by another person, should be permitted to be taken possession of, and incorporated with the different invention first contemplated by the patentee.

Referring, then, to Mr. Woodbury's provisional specification, I find that he states that the invention which he is desirous of having patented is "designed for the purpose of producing surfaces in relievo and intaglio (relief and depression) upon aluminous materials, such as porcelain, or other semi-transparent materials, so that when viewed as a transparency, the varying thicknesses in the material will show the picture or design; or for the purpose of producing relievo or intaglio in any plastic or fusible material, so as to have the appearance of a bas-relief or intaglio, and the invention is particularly useful in producing copies of such articles."

Now, what does this mean? What are these "surfaces in relievo and intaglio upon aluminous material, such as porcelain," which, "when viewed as a transparency, show the picture or design"? Most undoubtedly they are those picture-slabs of porcelain which show a picture when one looks *through* them; but when one looks *at* them in the way an ordinary picture is viewed, the image is not visible, but merely elevations and depressions on a white slab.

As to the vague phrase, "or other semi-transparent material," which may mean anything or nothing, one must suppose that at least the indefinite materials referred to are to be used for producing the same sort of things as the porcelain.

The other object contemplated by the patent, as expressed in the words, "or for the purpose of producing relievo and intaglio in any plastic or fusible material, so as to have the appearance of a bas-relief or intaglio," is still further from the idea, having for its object the production of medals, and articles of that nature.

Now, in this statement of the design of the patent, it must be remarked that no mention whatever is made of anything of the nature of a print, using that term in its ordinary acceptation; that is to say, "a picture to be viewed by reflected light, and which is formed by means of colouring matter, distributed unequally on a ground of a different colour."

Proceeding to read the specification further, it will be found that what Mr. Woodbury more particularly wishes to have patented is, his special mode of making the copper moulds required for moulding the transparencies and medals. His words are:—"The principle of producing a first mould, having varying thicknesses obtained from or rendered by the lights and shadows of a photographic negative, constitutes the chief feature of this part of the invention" (the other part being for the production of medallions, &c.), "which, being accomplished, the formation of copies or reverses therefrom in any material, becomes simple."

Surely, it cannot be pretended that the new system of printing is described by saying, "the formation of copies or reverses therefrom in any material, becomes simple"! Yet nothing more than that is said as to the manner of using the moulds, from the beginning to the end of the specification. In the new system of printing, it is the peculiar manner of *using* the intaglio plates, and not any particular mode of *forming* them, that constitutes the novelty.

The use of the gelatinous ink is a cardinal feature in the new process; no mention of it exists in the provisional specification; nor is paper mentioned; nor, in fact, anything whatever that conveys the idea of the new process. Coloured gelatine is for the first time mentioned in the final specification, filed five months after the writing of your article; but even there no detailed mode of its use in printing is given, and the limitations, imposed by the title and the design of the invention, as set forth in the provisional specification, are such as preclude the possibility of any valid claim to use it being set up; indeed, they still necessitate the supposition that only transparencies are to be produced.

How, then, I ask, can it be said that Mr. Woodbury "patented the idea at once"?

In what part of the specification is the new process to be found? The fact is as clear as fact can be, that the idea is not there.

It may be said that it is a question for lawyers. I think not. It is rather a question for common-sense as to the meaning of plain English, and if that is not sufficient for the interpretation of the meaning of a specification like this, I say the sooner we have done with patents the better.

It would be futile, it would be quibbling, to argue that the transparencies spoken of in the patent are identical with the new prints. There are broad and clearly marked differences between them:—For example, the one is a picture when viewed in the usual way, viz., by reflected light, the other is not a picture at all when so viewed; in the one, colour is essential, in the other it is non-essential; in the one, relief is an indispensable quality, not to be got rid of, in the other it is merely incidental—a defect, and one which in actual practice must be done away with. The name of photo-relief, used by Mr. Woodbury to designate his prints, is, of course, selected as a matter of policy, with a view to suggest their connection with his patent.

I trust I have said enough to show that there is no publication whatever of the new system of printing in Mr. Woodbury's patent, and that, therefore, it was first published and described in your own columns; also that it was from me that that publication virtually emanated.

Much regretting that there should have been occasion for me to write this letter,—I remain, yours, very truly,

Joseph W. Swan.

Newcastle, Sept. 28, 1865.

[It is no part of our duty to estimate the value of the patent claims of Mr. Woodbury, nor to attempt to decide whether his specification is either sufficiently precise or comprehensive to cover his claims. We do not even know whether the point on which Mr. Swan lays most stress forms a part of them. The specification is certainly not worded as we should have phrased such claims; but Mr. Woodbury's patent agent, experienced, we presume, in such matters, used his own mode, we are informed, of stating the matter, and affirmed that it did sufficiently cover all the claims made. If it ever be needful to decide the question, it must be done, we apprehend, by a legal tribunal; and if, as jurists affirm, the law is the perfection of reason, we presume it will be decided in accordance with the dictates of common sense. We can see that much can be said on both sides, but it is only necessary for us to add a word or two on our connection with the subject, and our use of it as a pertinent illustration of our argument on the subject of patents. Mr. Swan was undoubtedly the first to bring the subject under our attention and impress us with its importance. He did this in confidence six months before we published it. But he did, as we stated, and stated without even implied blame, exercise his abstract right to preserve his secret, for it was not until Mr. Woodbury had also communicated to us the same idea, and shown us a specimen, without any charge of secrecy, that Mr. Swan gave us permission to make the matter public. Now, had he not given us permission, we should have been bound to publish that which Mr. Woodbury had communicated, only suppressing Mr. Swan's name, an act of injustice which his own charge of secrecy would have rendered inevitable. Mr. Swan did not, therefore, publish so long as secrecy was possible, and our statement, that he exercised his abstract right, was clearly the simple truth. We do not in the slightest blame Mr. Swan for that secrecy. He had made a valuable discovery, and was waiting until he had further worked it out, before he determined in what shape he should give it to the public; and whilst he waited, circumstances precipitated the matter and determined for him. We have said he was an independent discoverer, and that we believe he was a prior discoverer. We furthermore with pleasure state that our ideas on the subject were derived originally from Mr. Swan, and that such clearness as there was in our enunciation of them was very much due to the earnestness with which Mr. Swan had impressed them on our mind. We are delighted to hear of Mr. Swan's further progress in the matter, a circumstance for which we were prepared, both by our knowledge of his ingenuity and perseverance, and by having observed that he had recently entered at the Patent Office some improvements in printing surfaces. We hope that the competing or combined efforts of both the discoverers of this method of printing may issue in the highest success, and that the unfortunate non-agreement between them may soon be lost sight of in the higher interest attaching to real scientific progress.—Ed.]

CLOUDS IN AUTUMN.

"Non fumum ex fulgore, sed ex fumo dare lucem."

Sir,—The pallette, the sketch-book, and the camera alike laid aside for the enjoyment of a few weeks' complete holiday in the finest autumn I remember, after a day amongst the partridges I take up my pen for a very brief reply to my courteous opponent, "An Artist," whose too-much protesting paragraph regarding his signature might suggest to suspicious minds a doubt as to its genuineness, or his claim to that honoured title. But let that pass.

I am happy to find that we shall really not quarrel. To his opening sentence, "How great a fire will a small spark enkindle!" I cannot demur; and it is scarcely worth remarking that it has been so often said before that it savours a little of platitude. He next admits that Mr. Robinson's "Autumn" is a "very meritorious picture," in which I cordially agree with him, although he thinks that, notwithstanding I scarcely alluded to it, I gave it "an overdose of praise." I hope whenever I attempt the critical function, that such will be my worst error, and that "e'en my frailties" will "lean to virtue's side." Spiteful criticism is so common, that I am delighted to have escaped the common vice. He next speaks of a "hornet's nest" being brought about his "unfortunate ears." What harm the nest would do I am at a loss to imagine; but perhaps, as he is, as I have before noted, somewhat inexact in his ideas and statements, he meant a nest of hornets. I should, however, be sorry if my remarks left any sting.

But to return to the clouds. "An Artist" did not speak of "*a* cloud and *a* shadow," but of "*the* shadow of a cloud" on a summer day, as if it were a definite thing. I simply pointed out that there were shadows of various depths from clouds of various densities which I had repeatedly seen, and seen them deeply overshadow one object, whilst another in close proximity was brilliantly illuminated; and further, that whilst this might be the case, a clear and cloudless sky might be presented to the eye of the painter, or of the camera, delineating the landscape of which such objects formed the foreground. I said I had seen this; and so might "An Artist," if he had observed nature. As for the conditions under which Mr. Robinson's "Autumn" was taken, I know nothing; and I will not be guilty of the impertinence of defending a picture which I know, from personal observations, does not violate natural conditions. Whether it altogether pleases "An Artist" or not is not, of course, a question worthy of disputing.

Regarding the quotation from Ruskin, that gentleman ought to be much obliged to "An Artist" for amplifying and interpreting his meaning. He must pardon me, however, for not accepting his exposition. I prefer the matter as Ruskin states it, in which he speaks of the sudden eclipse of portions of the landscape by the interruption of the sun's light by dense black clouds, so that, as he phrases it, "when you look to a place which was clear an instant ago, there is a cloud on it."

I won't pretend to enforce the literalness of the poets, beyond saying that I have found that the highest form of descriptive poetry has generally most exactly corresponded with the highest truth in painting, delineating the greatest and most sublime beauties in nature. It has been recently said in your columns that nature seems sometimes coy, and does not display her rarer beauties to unobserving eyes; and with those who have not seen, it is impossible to discuss. I may add, however, that I have seen golden sunlight, and hills looking blue and purple, without studying art on a tea-board. I thank "An Artist" for reference to the "Artist's and Amateur's Magazine,"—what a pity so many of these young art magazines have not constitution enough to carry them over the period of infancy!—and trusting that the correspondence on the subject, if not instructive, may be at least suggestive, beg, so far as I am concerned, to close the discussion.—Yours, sir, with much esteem,

Respice Finem.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

Sir,—We find on inquiry that great credit is due to Mr. Warner for the management of the clouds and the printing of Mr. Restall's negatives, and that the pictures were sent with the full consent of the owner, Mr. Grant. Under these circumstances the award will stand, and the subject of a further award to Mr. Restall will be brought under the notice of the committee.

With reference to the award being for the best landscape, it means after the one which obtained the premier prize, and would so appear in the list; but when so stated, not in conjunction with the list, it would appear to take precedence of Mr. Mudd's, which was not the case.—I am, sir, yours obediently,

Sydney Hodges.

Falmouth, October 2nd.

[We have received from Mr. Warner and from Mr. Restall long letters of statements and explanations relating to this matter. As it is probable that the decision above indicated will satisfy both gentlemen, we withhold their letters, and shall not publish them unless, on further consideration, we see that any good purpose is to be gained by giving portions of them publicity. Perhaps, however, it is only fair to Mr. Restall to state that he has sent us an untouched print from the negative of "Old Divie Bridge," the prize picture, which he states was printed without masking or any double operation—done, in fact, commercially, by boys. If this be the case, no extra clouds or masking appear to be necessary in this picture, which is quite clean, although a weak print.—Ed.]

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Talk in the Studio.

Stealing Lenses, &c.—At the Bath Police Court a few days ago, an operator named Henry Williams, was charged with stealing four photographic lenses, of various characters, a gold locket, a quantity of chloride of silver, and a meerschaum pipe, valued altogether at 25*l.*, the property of Mr. James Foote, photographer. The prisoner was in prosecutor's employ, and contrived to get possession of the property and then abscond. Information was given to the police, and detective Barnett traced the prisoner to London, and apprehended him with some of the property in his possession. One of the lenses was found pawned at Mr. Folkard's, Gray's Inn-road, and another at Wolstenhome's, Liquorpond-street. Prisoner pleaded guilty, and was committed for six months' imprisonment.

The New Iron Developer.—We were recently in the studio of Mr. Jabez Hughes, and found him working the gelatino-iron developer, described in our pages a few weeks ago. He uses nothing else, and the longer he tries it the more he is impressed with its value. Flowing over the plate like oil, its wave does not stop or cause markings, or if the flow be accidentally arrested, the developing action, not commencing immediately, gives time to get the film covered before irretrievable stains arise. It develops slowly and evenly, bringing up the intensity in almost every instance with one application, and permits any continuance of the action without fog. It appears to be just what is required in iron development, the negatives being especially distinguished by roundness and modelling.

Magnesium Light.—At a Conservative banquet recently given at Cheltenham, the grounds were illuminated for three hours with the magnesium light by Mr. G. E. Alder; the effect produced on the colours of foliage, &c., being nearly similar to that of daylight. The lamps of Solomon and Grant were used.

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To Correspondents.

Delta.—We have not had much practical experience in the use of very weak silver baths with organic matter, for printing, but have seen capital results so produced, and have not had, or heard of, any contrary experience. We hope shortly to publish something on the subject.

G. U. N. sends us a print having a very singularly reticulated effect all over; unlike the reticulation which arises from collodion containing water, in which the cracks print blacker than the rest, these crack-like markings are denser in the negative, and print whiter than the rest. At first we thought it was the result of using a background with a fine diaper pattern, as it appears more definitely marked on the background than elsewhere. Our correspondent states that it is the result of using the gelatino-iron developer, and that it always occurs. We see no reason why it should do so. Try using less gelatine, and also washing very carefully before drying. 2. You will find several articles on the production of doubles in our recent numbers. In the News for March 31st you will find full information.

N. E. D.—Light always travels in straight lines, and cannot be bent or directed, like a stream of water. If it is intercepted by any body, it is partly absorbed and partly reflected from the surface of that body, the amount reflected depending on the nature of the surface. It is reflected back exactly at the same angle at which it impinges on the surface. Thus, supposing a screen were placed at the north end of a room, and a ray of light reach it from a source in the east at an angle of 45°, it would be reflected to a point at 45° in the west. In all cases the light thrown on to a sitter by blinds is reflected light, and all reflected light, even from a mirror, is much less intense than direct light. As to whether the photogenic quality of light is injured by being reflected, depends entirely on the colour of the reflecting surface. If the reflecting surface be white, it will reflect white light; but the amount of light will always be less, and therefore the exposure will be longer than with direct light. With such a roof as that you indicate, blinds after Mr. McLachlan's principle might possibly be arranged so as to admit nearly all the direct light, and to reflect on to the sitter a portion of the light reaching the roof from behind.

Old Photo.—The unfixed prints you enclosed us did not reach us (having been some days from home), until they were so discoloured that we could form no opinion of them. It is probable, however, that the imperfect toning is due to an inert toning bath. 2. You must have used either too much gelatine, or met with a very unusual sample. Try diluting it with an equal bulk of a 20-grain solution of protosulphate of iron. 3. A good portrait lens or a triple is best for enlarging.

Wm. White.—Many articles on our new printing process have appeared in the Photographic News. If you wish to practise it upon opal glass you will find an article in the number for May 12th; if for paper, the article we read before the Photographic Society, which appeared in the News for March 17th, will answer best.

Light and Shade.—Your prints are very excellent, and your progress satisfactory. No. 1 is brilliant and delicate, but there is a little too much top light to do the eyes full justice. No. 2 very good. No. 3 very pretty indeed. No 4 good photography and well grouped. No. 5 is good, but the hands and legs are not quite graceful. No. 6 is very good. Go on improving. Observe all the good pictures you can, and emulate their good qualities. The articles by Mr. Lake Price in our third and fourth volumes contain the best hints to which we can recommend you on composition.

John Fieldhouse.—The definition in the pictures you inclose is not good; the lens is apparently not suited for the work. We regret, however, that we cannot help you by undertaking the invidious task of expressing an opinion as to the cheapest and best lens. A low price in a lens is incompatible with the certainty of obtaining excellence.

P. N. L.—For a self-taught photographer, and pictures taken in the open air, the portraits you enclose are exceedingly good, and show great care and skill.

A. E. G.—In strengthening a printing bath containing nitrate of potash, it is only necessary to add more nitrate of silver. We are glad to hear of your satisfactory experience with nitrate of potash in the bath.

Enquirer.—In giving a formula, the proportions of the materials are stated without reference to the quantity to be made, so that it is very easy to take two drachms of a solution, of which the formula for making one drachm is given. Two drachms of the gold solution, and two drachms of the mercury solution, are to be put into one 4-oz. stock bottle, which is then to be filled up with water, and this forms the intensifier ready for use.

G. A. B.—Received with thanks, ands hall receive due attention. Regarding the collodio-chloride which gives too weak an image, try adding a little more of a good sample of pyroxyline to it.

E. K.—We have not met with a case in which the use of cyanide caused paralysis or local loss of power; its injurious action when applied locally generally consists in the production of ulcerations. But we will give the matter further attention, and recur again to it. In any case, give up its use at once.

Inquirer.—We will read the article and let you know. The passage as you quote it is certainly incorrect.

Several correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 371.—*October* 13, 1865.

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LIKENESS IN PHOTOGRAPHIC PORTRAITURE, FAMILIAR AND OCCULT.

In an article on the subject of likeness in photographs, some time ago, we insisted on a satisfactory resemblance to the original being a primary excellence in a portrait of any kind, taking precedence, indeed, of all other qualities. The resemblance which is thus important is that which is sufficiently familiar and striking to be recognized by the least analytic of observers, and which does not require ingenuity to discover, or argument to enforce. It should be the kind of resemblance which a child would recognize, and which must depend more on the *vraisemblance* of the whole than on the perfection of any individual part.

The production of such likenesses is not so common in photography as it ought to be, and although good photography is important to the production of a good likeness, it depends less on technical excellence in the picture than on the exercise of good judgment on the part of the sitter. It is dependent also upon other matters beyond the control or knowledge of the portraitist, but in regard to which he should exercise, as far as possible, a watchful supervision. We now refer to the circumstance which professional portraitists know so well, and from which they suffer so much annoyance, such as the entire change of the ordinary costume on the part of the sitter when preparing to sit for a portrait. How often a lady who usually wears her hair plainly braided, curls it especially for the express purpose of sitting for her portrait, to the entire destruction of anything like familiarity in the resemblance? and so with other modifications in the general costume. The portraitist should suggest, wherever opportunity serves, the importance of preserving the usual and familiar appearance in the arrangement of dress, &c., in all cases where the portrait is to be prized as a likeness of the sitter rather than preserved as a memento of some special effect of costume.

But one of the most valuable aids to familiarity of effect in a portrait is the securing of characteristic position, a thing nine times out of ten lost in the arrangement made by the portraitist. The sitter is placed in a chair, very often of unusual construction, perhaps low in the seat, possibly straight-backed, and mediæval; he is then arranged so as to bear a given relation to the position of the camera, and to the arrangement of the light; his hands are placed in approved form; his head is fixed in a rest; he is directed to gaze at a certain spot, and he is then invited to look pleasant, and sit perfectly still. He becomes at once conscious of the vital importance of the moment; if he is doubtful of his steadiness, he makes a special effort, with a look of ferocious agony, to sit perfectly still; if he is more anxious about the expression than about his steadiness, he probably puts on an insufferable smirk. In either case a portrait with nothing of familiar likeness is the result. We take it that the shrewd and observant portraitist will direct his sitter to take his seat, and will then, observing the position naturally assumed before "arrangement" has commenced, with the least possible disturbance of the position, secure the general disposal of the figure; and, wherever it is possible, produce the necessary variety by moving the camera and re-arranging the light to suit the sitter, rather than arrange the sitter to suit the position of the camera and the light. The more like the interior of an ordinary sitting room the studio can be made, the more comfortable the accessories; and the less formal and exacting the arrangement of the sitter, the more familiar the likeness will probably be.

There is another important consideration, we know, which will have weight in the minds of many, which will frequently interfere with the familiarity of the likeness. If the question be asked, "Is it of more importance to secure a good photograph and agreeable picture; or to secure a familiar and satisfactory likeness?" many will answer that it is more important to secure a good picture; that if the photography and the pictorial arrangement be good, the likeness ought to be satisfactory; and to such an extent is this feeling carried by some, that they are literally unable to perceive or acknowledge that the likeness is bad, if the picture be good. The defect, they allege, is a want of perception in the observer; or the sitter's face is one which "does not make a striking likeness." In any case, the photography is good in all points, and there is nothing pictorially wrong, and therefore the portrait ought to be good, and if it is not, the portraitist cannot be to blame, they fancy. We have so often insisted on the importance of artistic arrangement, and the importance of making portraits pleasing and striking pictures, that we shall not be misunderstood, we hope, if we say that in some instances this very desire interferes with the familiarity of the likeness.

We have a case in point before us in the shape of a series of portraits of an intimate friend, with every phase of whose fine and striking countenance we are familiar. He has delighted the public, counting his readers by hundreds of thousands, and made some fame and position for himself, as a novelist, essayist, poet, &c.; has been photographed by many artists, each of whom have doubtless striven to produce an effective portrait of a man of mark. Here are cards and whole plates by various first-rate photographers, amongst whom we may name Robinson, Watkins, Lock and Whitfield, Blanchard, Cundall and Downes, the London Stereoscopic Company, and others, and of these, whilst all are more or less good pictures, and all more or less like, there are but two which are thoroughly characteristic and satisfactory, the chief fault in most of them being too much striving after effect. In one we have a profile with chin thrown up, and the whole effect self-asserting and truculent; in another we have a standing figure, with open book in one hand and a finger of the other hand laid on a page, reminding you of

Mr. Chadband holding forth, as delineated in "Bleak House;" and so on with others. These effects were doubtless present before the camera at the moment when the plate was impressed, and were the result of an unskilful striving after striking effect in the pose and arrangement. Many operators, in their desire to avoid producing the mere maps of the face, which have been so often charged on photography as its normal product, fall into this opposite extreme of inducing the sitter to act a part; and as very few persons are good actors, it is not surprising that in such cases the portraits, however excellent as pictures, are unfamiliar as likenesses. Let the portraitist ever bear in mind that the less importance the sitter attaches to the vital moment of exposure, the more natural will be his expression; the fewer injunctions as to looking pleasant, sitting still, keeping his eye fixed, &c., the less likely he will be to look affected and simpering on the one hand, or nervous and anxious on the other.

Besides the advantages of a quiet and natural portrait in possessing familiar likeness, it often possesses another advantage in having certain occult traits of likeness, only discoverable under special circumstances. This is a peculiarity of a really good and natural photographic portrait, which to the psychologist and physiognomist is an interesting study. How often, in a good photographic portrait, a family likeness to a relative is discovered, which had not been apparent to any one in the original! How often, in the photograph of a child, is suddenly perceived its wondrous likeness to a dead grandsire, which until that moment had never been thought of—

"As sometimes in a dead man's face,
To those that watch it more and more,
A likeness, hardly seen before,
Comes out—to some one of his race."

We have seen such a likeness come out in the beautified face of the dead; and we have often seen it in the photograph. It is generally in the simple, unconstrained, familiar likeness that these unfamiliar or occult phases of resemblance are most present as well.

Nathaniel Hawthorne, in his charming romance, "The House with the Seven Gables," gives another striking illustration of this presence of occult likeness in photographs, even in a case in which the familiar or obvious likeness is wanting. We will quote the passage describing this for the benefit of those who may not remember it. A photographer is speaking:—

"There is a wonderful insight in Heaven's broad and simple sunshine. While we give it credit only for depicting the merest surface, it actually brings out the secret character with a truth no painter would ever venture upon, even could he detect it. There is at least no flattery in my humble line of art. Now, here is a likeness which I have taken over and over again, and still with no better result. Yet the original wears, to common eyes, a very different expression. It would gratify me to have your judgment on this character." He exhibited a Daguerreotype miniature in a morocco case. Phœbe merely glanced at it, and gave it back.

"I know the face," she replied, "for its stern eye has been following me about all day. It is my Puritan ancestor, who hangs yonder in the parlour. To be sure, you have found some way of copying the portrait without its black velvet cap and grey beard, and have given him a modern coat and satin cravat instead of his cloak and band. I don't think him improved by your alterations."

"You would have seen other differences had you looked a little longer," said Holgrave, laughing, yet apparently much struck. "I can assure you that this is a modern face, and one which you will very probably meet. Now, the remarkable point is, that the original wears, to the world's eye, and, for aught I know, to his most intimate friends, an exceedingly pleasant countenance, indicative of benevolence, openness of heart, seeming good-humour, and other praiseworthy qualities of that cast. The sun, as you see, tells quite another story, and will not be coaxed out of it, after half a dozen patient attempts on my part. Here we have the man sly, subtle, hard, imperious, withal, cold as ice. Look at that eye. Would you like to be at its mercy? At that mouth. Could it ever smile? And yet if you could only see the benign smile of the original! It is so much the more unfortunate as he is a public character of some eminence, and the likeness was intended to be engraved."

"Well, I don't wish to see it any more," observed Phœbe, turning away her eyes. "It is certainly very like the old portrait."

The Daguerreotype here tells the truth. The smiling descendant of the stern old Puritan is really a man, hard, cruel, and black of heart; and these qualities, in conjunction with the family traits of a race, persistently make themselves apparent in the picture limned by the sun, even though imperceptible to common observers of the original. The possession of these subtle peculiarities of likeness is a quality of much importance in historical portraiture, whether the history be that of individuals, of families, or of nations, and is one well worth noting and preserving. The quality can only belong to honest untouched photographs, free alike from affectation and constraint; the simple rendering of a face with a natural expression, with due attention to the best technical appliances of lighting, arrangement, exposure, and development.

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ON THE REPRODUCTION BY PHOTOGRAPHY OF ANCIENT WRITINGS, MANUSCRIPTS, ETC.

BY CAMILLE SILVY.*

Some years since I had the honour of presenting you a copy of the Sforza manuscript, a reproduction of which of the same dimensions I had made by photography.

In the course of that work several phenomena presented themselves, which appeared to me sufficiently interesting to lead me to lay them before you.

Not only the writing, which was confused and indistinct in the original through the discolouration of the ink and colour of the parchment, had become more visible in the photographic copy, but certain passages, moreover, reappeared, which in the manuscript were totally effaced.

This caused me to advance that photography, besides giving exact reproductions, could, in certain cases, be an instrument in restoring writings.

I hasten to-day to communicate to you a novel and striking example of it in submitting to your inspection an engraving of a portrait by Mignard, and the reproduction of equal size, which I have executed.

This engraving represents the portrait of the Prince Cardinal Emmanuel-Theodore de la Tour d'Avergne, and Duke of Albret, and beneath a notice in writing was added, indicating the place and date of his death, as well as the age at which he died. Baron Marochetti, the possessor of the engraving, had not himself perceived this notice before it was brought out in the photographic reproduction; the words had doubtless been effaced by some one who considered that this line of writing spoiled the engraving. The last letters alone are now apparent, and the ink remaining on the paper is so wholly discoloured as to be almost invisible.

However, the photographic copy distinctly reproduces the obliterated writing, and the following notice can easily be perceived:—

'Mort, doyen des cardinaux, à Rome, le 3 Mars, 1715, agé de 72 ans." ("Died, dean of the cardinals, at Rome, the 3 March, 1715, aged 72."

The explanations that might be given are many, how this phenomena is produced; but what is of real importance is, that once the fact well proved, the useful application that might be made of it.

From the first communication I had the honour to submit to the Academy des Inscriptions et Belles Lettres, in October, 1860, the most lively interest was shown, and every encouragement given me to continue these operations. M. C. Giraud, in giving an account of them in the *Journal des Savans*, went even so far as to express the hope that a photographic reproduction of the palimpsestes at the Vatican should be attempted, and especially of the Treatise by Cicero, "De Republicâ," the text of which, even to this day, is the subject of such earnest discussion.

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* M. Silvy has courteously favoured us with a copy of the above interesting paper, communicated to the "Société Française de Photographie" in May last, together with a copy of the engraving which admirably illustrates the valuable results he describes.—Ed.

In fact, the palimpsestes, or parchments, which have successively received different writings, offer this special interest, that in bringing to light the effaced letters we may thus reproduce the original text. Thus, beneath the Commentary on the Psalms by St. Augustine, Cardinal Angelo Mai, keeper of the "Bibliothéque Ambrosienne," discovered a portion of the Dalogues of Cicero "De Republicâ," which he arranged and published in 1822.

But these partially obliterated manuscripts are not always capable of being read, and we therefore must have recourse to the action of certain chemical agents to restore to the ink the colour it has lost. Black inks containing generally salts of iron in their composition, it is by the aid of a solution of Levant gall or tannin spread over the whole surface of the sheet that we can restore the letters; at least, it was the method employed by Cardinal Mai to restore this manuscript, which two years since I carefully examined at Rome, with the object of a possibility of its reproduction.

The results obtained by these means are so far satisfactory, but accompanied by a serious evil, for although it procures a momentary restoration of the text, it eventually destroys the parchment operated on, and that by an action easily accounted for.

The tannin spread over the sheet acts on the molecules of the oxide of iron contained in the ink, and is transformed into tannate of iron, which, moreover, sets at liberty traces of sulphuric acid; this acid, united with the tannin acid, filters itself between the pores of the parchment, and finally, by separating the molecules, effectually destroys the organic substance on which the writing existed.

The more the tannin solution is concentrated, the more rapid the destruction of the parchment; thus, of the pages composing the manuscript in question some are intact (pp. 59, 84, 98, 110), and the original text appears beneath the other of a yellow colour, but sufficiently distinct, however, not to require restoring; others have been slightly washed, and the writing shows itself of a deep black; others, finally, have been treated with a very strong solution, and in these the letters are entirely disjoined and eaten away by the acid.

At page 40, four lines are completely obliterated, and it has been necessary, in order to preserve the fragments, to paste them on vegetable paper. It is the same at pages 86, 126, 127, 139, 262, 285, 286, 293, 295, 299, which are all more or less injured by the incessant action of the acid.

The letters being eaten through by the acid add to the confusion of the text, since those of the *recto* and those of the *verso* are no longer separated by an intermediate sheet, and the parchment itself, in the places where no writing exists, is spotted and discoloured by the solution with which it has been covered.

In presence of these evils, I have no need, gentlemen, to argue in order that you should appreciate the advantages there would be in the employment of photography in reproducing and restoring palimpsestes. The copy I place before you shows with what precision the reproduction is obtained, and how, in increasing the tone of the impression, we can, with the same negative, obtain proofs more or less distinct. Without doubt the success depends also entirely on the care with which the photographic reproduction is executed, for even as it is possible to produce an image clearer than the original, so it may also happen that it may be inferior unless the operator take all the care this work requires.

Now that the process of printing is more and more perfected, and the transferring of photographic proofs to steel or stone progresses so much, the question of the reproduction of manuscripts becomes more important than ever, and if there still exist a prejudice against the use of photography in libraries, let us hope it will cease before the immense and incontestable advantages this process offers over those hitherto employed.

M. le President remarked that the communication of M. C. Silvy presented a very important interest, for besides the services photographic reproductions may render in an archæological point of view, the process might be equally useful in another light; possibly, in fact, we could by this means restore writing discoloured by chemical action, for criminal purposes, but which writing was not sufficiently destroyed, by that action, so as to leave no trace.

The President also remarked that to partially restore obliterated ink, the use of prussiate of potash would be better than tannin, as it would have no injurious action on the paper. M. Girard added that already, at least once, the photographic reproduction of ink effaced with a criminal design had been essayed by a French chemist; "but, unfortunately," added M. Girard, "my recollection cannot at this moment recall either by whom, or under what circumstances, the essay was made, the fact alone being present to my memory."

The society having examined, with much interest, the original engraving and the reproduction presented by M. C. Silvy, addressed to him their sincere thanks for the communications he had made.

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A MODIFICATION OF THE NEW ORGANICO-IRON DEVELOPER.

BY H. COOPER, JUN.

At the meeting of the North London Photographic Society, held on the 4th inst., I had the pleasure of bringing before the members some specimens produced by a modification of the organico-iron developer, which has given the most perfect results. It has since been proposed to me that it would be advisable to write the formula myself, in a concise manner, for convenience in reference, for those who may be desirous of giving it a trial. As I consider this developer to be one of the most useful and important practical discoveries of late, I shall now proceed to do so, referring readers to the report of the meeting for some cursory remarks on its good qualities and advantages.

You must first procure some good gelatine—the ordinary French sheet answers well—and place two drachms of it in a common jam pot, or other convenient *earthenware* vessel, with four drachms of water. Then add one ounce of common strong sulphuric acid. Upon mixing well together with a glass rod, the temperature will rise considerably, and the gelatine will begin to be decomposed. If the mixture be stirred occasionally, the action will be complete in about twelve hours, sometimes in a much shorter time. The gelatine will have entirely dissolved, and the solution will not be more viscid than dilute sulphuric acid.

One thing that I forgot to mention at the meeting is the necessity of adding about 4 ounces of water to the sulphuric acid and altered gelatine at this stage of the operation. This is absolutely necessary, and must on no account be omitted. Now add sufficient aqua ammonia to neutralize the free sulphuric acid. It is as well to make the solution slightly alkaline, as any trace of sulphuric acid must not remain. The effect of omitting to add the four ounces of water before neutralizing will be that when the ammonia is added, a violent action will ensue, and the liquid will be spirted about in all directions; and I can assure you that strong sulphuric acid is not an agreeable thing to get upon the hands, face, or clothes; but if you proceed in the way described above, there is not the slightest danger. The next thing is to raise the solution to the boiling point. This may easily be effected by standing the vessel containing it on the hob, or in an oven. After it has cooled, add sufficient water to make the total quantity 8 ounces, and then filter. This we will call solution No. 1.

Now, to make solution No. 2, soak 1 drachm of gelatine in 6 ounces of water for a couple of hours, then add 2 ounces of glacial acetic acid. By shaking or stirring a few times the gelatine will be soon dissolved. If not quite clear it must be allowed to settle until it is so. Then add it to solution No. 1.

You will now have a stock solution of 16 ozs., which is to be used in making the developer instead of plain acetic acid. A very useful formula is the following:—

Protosulphate of iron...	25 grs.
Mixed solution, prepared as described	2 drachms.
Water	1 oz.

This, you see, gives a developer of the strength of 20 grs. to the oz. A stronger or weaker one may be used at discretion, by altering the proportions of the above formula. As I hope to bring the subject before you shortly in a better form, it will be sufficient for the present to add, that in my hands this developer has given the most complete satisfaction; so much so, that since I first tried it I have used no other, except for experiment. Some of its peculiarities, mechanical as well as chemical, were stated at the North London meeting, so I need not recapitulate them here. I shall be happy to answer any inquiries through the medium of the Photographic Journals.

In mixing the two solutions a few precautions are necessary. The best way to proceed is the following:—We will suppose that you have made eight ounces of each solution, as has been already directed, the same method of treatment being adopted if the quantity be larger or smaller: take seven ounces of No. 2, and gradually add some of solution No. 1, stirring or shaking meanwhile, until a permanent milkiness is apparent; then add sufficient of the reserve ounce of No. 2 to render the solution bright and clear. I have not yet made many experiments to ascertain the cause of this milkiness; all I can do at present is to state the bare fact that if some of No. 2 be poured into No. 1 a ropy precipitate is formed, which is redissolved in an excess of No. 2. If it be preferred, and I think it is better, the two solutions may be kept separate, and one drachm of each added to the ounce of developer.

The only difficulty in the preparation of this developer is in solution No. 1; but I think that very soon it may be purchased of some chemists ready prepared.

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COLLODION WITH IODIDE OF SILVER.

BY M. MC. A. GAUDIN.

I have on many occasions suggested the idea of making iodide of silver enter into the composition of photographic collodion with the view of increasing its sensitiveness. I have also said that in certain conditions iodide of silver was insensitive to light, but I did not venture to assert that any iodide could *brave* the light indefinitely as in collodions ready for use, which it is best not to expose to too strong a light, but which will endure the effect of diffused light during entire months.

I am emboldened to propose anew the introduction of iodide of silver into photographic collodion from the result of a recent study I have made of a new preparation of photogene which has procured for me a very marked progress. I have succeeded in preparing some photogene which, poured upon glass plates, will keep for two days in a fit state to yield pictures, without any other precaution than that of pouring it on, and leaving it to dry. In certain cases, the penetration of the developer is so great, that after having left a coated plate in the developing solution of gallic acid an immoderate time, the lights were still vitreous, while the blacks were hard from the quantity of silver they had fixed, which consequently rendered them absolutely opaque.

Thus the problem of the application of the photogene to negatives appears to me fully resolved; but it still remains to adapt it to the taking of positives by transparency, and to the multiplication of negatives, which appears to me very difficult. The photogene such as I now prepare retains a principle of humidity which is perhaps the cause of its preservation during one or two days; but for the same reason, by tapping it with the palm of the hand, we become certain that it is never perfectly dry, and that we cannot apply anything to its surface without running the risk of tearing it. I still hope, however, to overcome this latter difficulty, as I have all others. Meanwhile, the idea has occurred to me of converting the collodion into a compound intermediate between ordinary photographic collodion and photogene, with the view of increasing its sensitiveness and porosity.

Ever since the first application of collodion it has been proposed to introduce iodide of silver into it; and although at that period iodide of potassium was exclusively employed, it was given up, doubtless under the persuasion that this iodide decomposes in the light, and fogs the proofs. We know now-a-days that such a thing is absolutely impossible, since in presence of iodide of potassium it produces the reverse effect. Iodide of silver exposed to light to the maximum, returns to the state of insensible iodide when it is in contact with iodide of potassium in presence of light. But what iodide of potassium produces with great energy, all the other iodides effect in a more or less marked degree, to such a point at least, that *the iodide of silver, produced with an excess of metallic iodide, is constantly and always insensitive to light.* Consequently, we may produce as much as we wish in a photographic collodion, provided that we increase beforehand the proportion of metallic iodide; then, after sensitising, we shall have, on the one hand, the iodide of silver forming part of the collodion, *plus* the iodide produced in the bath.

In supposing that the iodide in suspension in the collodion remains insensible even after the sensitizing of the plate, it is presumable that it will at least serve to increase the porosity of the collodion, which is the essential condition of the success of dry collodion, and contributes in great part to procure sensibility.

For a collodion prepared with anhydrous ether and alcohol acquires an impermeable horny nature, which injures its sensibility, while the slight proportion of water which accompanies the ether and alcohol commonly employed in the preparation of collodion suffices to give the collodion a *spongy* texture, which permits the reagents to penetrate the entire substance immediately. I say, then, that as a make-shift, the presence of iodide of silver in collodion will produce an effect of this kind; and if the developer, after exposure, does not convert it into metallic silver, it will at least disappear during the fixing, and the negative will not be less transparent in the lights.

To prepare this collodion with iodide of silver it will be sufficient to agitate ordinary photographic collodion with some fragments of nitrate of silver *crystallized in the dark*, because the iodide produced by the contact of the nitrate is, at that moment, sensitive to light, and it loses this faculty only when it is moistened with a solution of iodide; but then it has become insensitive. Thus, as soon the nitrate of silver has entirely disappeared, the collodion will submit to the action of light indefinitely. If it be wished to force the iodide of silver, it will be well beforehand to increase the iodide in the collodion. By this operation the collodion becomes opaline, like sensitized collodion; but in proportion as the saturation of the metallic iodide approaches its limit, the iodide tends to coagulate, and the phenomenon of coagulation rarely fails to take place as soon as the nitrate of silver comes to predominate; that is to say, when the photogene is produced; and it is this which renders the inverse operation so difficult; that is to say, the preparation of photogene which results from the formation of the iodide of silver in an excess of nitrate of silver.

Besides, there exists a very simple means of knowing if this process procures sensibility. It suffices to proceed as I have indicated a long while ago, for the comparison of the sensitiveness of collodions. After having poured into a little bottle some ordinary sensitized collodion, and shaken it up with some fragments of crystallized nitrate of silver until it has acquired a very marked opaline tint, half cover a little glass plate with it, reserving the other half for collodion not converted; and after the sensitizing, place across the line of junction of the two collodions, and upon the back, a plate of yellow glass or piece of yellow paper, and then cause the daylight to fall directly upon this plate, entering in the darkened operating room by an aperture, counting ten seconds before removal, and a second ten seconds after the removal of the plate. By this means we obtain on each collodion three intensities, corresponding with 10—1 and 0; and from the first glance the sensitiveness and relative capabilities of the two collodions may be judged.—*La Lumière.*

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AWARDS AT THE DUBLIN EXHIBITION.

We subjoin the remaining portion of the reports and awards at the Dublin Exhibition which have interest to photographers. In the report of the chemical section we find the following:—

Perhaps there is no section that embraces such a mixture of different classes of exhibitors as Section II. One of them is a photographic firm, and as there is a special section for photography, it at first sight might appear strange that they compete in Section II., but they appear as manufacturers of photographic collodions and other chemicals, also as the inventors of a new photographic chemical process. It is with much pleasure that the reporter is enabled to treat in a few words of the inventions of such importance as are here exhibited by Messrs. Mawson and Swan (United Kingdom, 27). There have been two *desiderata* in connection with photography, each of which has been, from time to time, the *summum bonum* of photographic ambition. One was the printing in carbon, so that the picture might be permanent, and the other the fixing of the natural tints in the picture. The first we may consider as accomplished by Mr. Swan—not only accomplished, but worked out with such results that the most fastidious cannot cavil. This process is based upon the fact that gelatine, containing a small quantity of bichromate of potassium, is rendered insoluble when submitted to the chemical action of the sun's rays. All attempts in this direction had hitherto failed, as no half tones were produced. The specimens shown are beautiful in the extreme. The liability of photographs to fade has tended more than anything else to narrow photography as an industrial art. Messrs. Mawson and Swan also show collodion remarkable for extreme sensitiveness, and yet having been more than six months iodized. They also show collodion for glazing pictures, and also for fixing crayon drawings (a new idea). Also a new application of Mr. Wharton Simpson's "collodio-chloride of silver" for glass printing. Mr. Simpson's original preparation would not do for this purpose,[*] and we believe the preparation shown contains citric acid.

The medal awarded to Messrs. Mawson and Swan is described as "for photographic collodion."

The awards of medals to colonial and foreign photographers are as follows:—

Osborne, J. W. (now of Boston, U.S.)—For his photo-lithographic process, shown under the names of Korn and Co., Berlin, and C. W. Liger, Victoria.

Adams, B., Munich.—For excellence in his reproductions of paintings.

Panhard, Bros., Paris.—For excellence of manipulation, and artistic skill.

Duvette, A., Paris.—For his mode of enlargement to an extraordinary size of microscopic objects.

Lyte, F. M., Bagnères de Bigorre.—For excellence of manipulation and artistic choice of subjects.

Dagron, Paris.—For his micro-photographs, and ingenious arrangements for taking and showing them, &c.

Hanfstaengl, H., Dresden.—For excellence in his reproductions of paintings.

The awards of "Honourable Mention" are as follows:—

Nelson and Marshall, 11, Upper Sackville Street, Dublin.—For their cartes de visite.

Cranfield, T., Grafton Street, Dublin.—For his artistic arrangements of portraiture.

Silvy, C., 38, Porchester Terrace, London, W.—For artistic excellence.

Hennah and Kent, 108, King's Road, Brighton.—For artistic merit.

Cooper, H., Jun., 5, Aberdeen Park, Highbury, London, N.—For his good manipulation.

Wane, M., Douglas, Isle of Man.—For artistic merit.

Manchester Photographic Company, 14, Ridgefield, Manchester.—For the interesting collection contributed by its members.

Turner and Everitt, 3, Cheapside, London, E.C.—For good manipulation.

Good, F. M., Western Road, Hove, Brighton.—For good manipulation.

Brownrigg, T. M., Constabulary Office, Castle, Dublin.—For good manipulation.

Warner, W. H., Ross, Herefordshire.—For good manipulation.

Sanderson, W. D., 2, Mulberry Street, Manchester.—For good manipulation.

M'Lean and Hayes, 7, Haymarket, London, S.W.—For their interesting series of instantaneous pictures of wild animals.

Piper, J. D., 24, Silent Street, Ipswich.—For excellence of manipulation.

Bullock, Bros., 20, Lower Parade, Leamington.—For artistic composition.

Sedgfield, W. R., Kingston-on-Thames.—For good manipulation.

Penny, G. S., 14, Rodney Terrace, Cheltenham.—For good productions by the tannin and malt process.

Currie, F. E., Lismore Castle, Lismore.—For good manipulation.

Cameron, Mrs. Freshwater Bay, Isle of Wight.—For artistic composition.

Haines H., 82, Grand Parade, Cork.—For good manipulation.

Wardley G., 10, St. Ann's Square, Manchester.—For good manipulation.

Jones, B., Selkirk Villa, Cheltenham.—For good productions by the tannin process.

Coghill, Sir J. J., Bart., Glen Barrahane, Castletownsend.—For good manipulation.

Collis, J., 2, Richmond Terrace, London.—For good manipulation.

Frith, F. Jun., Reigate.—For good manipulation.

Bull, J., Anglesey Villa, Cheltenham.—For good manipulation.

Watkins, H., Regent Street, London, W.—For good manipulation.

Smith, J. S.—For good productions from paper negatives.

Board of Works, Quebec.—For the collection exhibited by them.

Henderson, A., Montreal.—For his good manipulation.

Henry, C. S., Lennoxville.—For his good manipulation.

Notman, Montreal.—For his good manipulation.

Buxton, E. C.—For his interesting collection.

Chambers.—For good manipulation.

O'Donnel.—For good manipulation.

Parish.—For good manipulation.

Meagher, P., 1, Coppice Row, Farringdon Road, London, E.—For his pantoscopic camera, tourists' stereoscopic cameras, and for general excellence of workmanship.

Ottewill, Collis & Co., 24, Charlotte Terrace, Barnsbury Road, London, N.—For workmanship of photographic cameras.

Solomon, J., 22, Red Lion Square, London, W.C.—For a steady photographic stand, a magnesium lamp, a large woven back-ground, and several convenient photographic appliances.

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AN IMPROVED URANIUM TONING BATH.

BY LE ROY GATES.[*]

I have had the toning process which I describe below in constant and successful use about a year. It has performed so satisfactorily with me, that in that time I have not attempted to try any other; it has never failed. The experience of many of my neighbours to whom I have com municated it, also fully agrees with my own. In order, now, that the whole profession may have the benefit of it, I feel it a duty and pleasure to make it known through the Journal.

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[*] This is slightly inexact. We had printed good pictures on glass with our original preparation; but had not devoted much attention to that department. To Mr. Swan belongs the credit of directing especial attention to this application of the collodio-chloride process, and of making a valuable modification in the formula expressly suited to the purpose of glass printing.—Ed. Photographic News.

[*] From the *American Journal of Photography.*

I dissolve 50 grs. of nitrate of uranium in 5 oz. of water. To this clear solution I add a saturated solution of bi-carbonate of soda, with constant stirring, till it becomes slightly alkaline to litmus paper. On the addition of the soda, the solution becomes turbid, and a yellowish precipitate falls. The solution is now filtered, and sufficient water is added to make up 6 oz. The clear filtrate is solution No. 1.

On the other hand, I dissolve 15 grs. of chloride of gold in 6 oz. of water, and I thus have solution No. 2. These solutions may be kept indefinitely, and are always ready for use.

For toning I add 1 oz. of each solution to a pint of lukewarm water, and proceed in the usual way. In case the chloride of gold is quite acid, it is advisable to use less water in the bath, or neutralise it with bi-carbonite of soda. I make my own chloride of gold, and am thus sure of its strength. The chloride of gold, however, which is commonly sold, being deficient in strength, will not, of course, bear so much dilution.

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PHOTOGRAPHING THE MOON.

We have now on the wall of our office the finest photograph of the moon that has ever been produced. The negative was taken by Lewis M. Rutherford, Esq., the well known amateur astronomer of this city, and the enlarged positive was made by O. G. Mason, a very intelligent and skilful photographer, of No. 599, Broadway. The negative is $1\frac{7}{10}$ inches in diameter, and the positive, 21 inches; it represents the satellite with one-half the illuminated surface turned toward the earth.

From the minuteness of the details and the sharpness of the outlines, this photograph affords nearly as good an opportunity to study the surface of the moon as a direct view through a powerful telescope. The surface is extremely rough, and along the boundary line between the illuminated and unilluminated portions it presents the appearance of being a complete series of vast, deep cavities. with raised edges, and generally with a steep lofty cone rising from the bottom near the centre. These cavities are all shaded upon the side next the sun, and illuminated upon the opposite side—showing that they are depressions and not hills; a white spot marks the summit of the central cone as it is tipped by the level rays, while the appearance of the circular boundaries of several of these cavities far out in the obscurity of the unilluminated region proves conclusively that their edges are raised above the general level.

The light of the moon is so feeble that it will not produce an instantaneous photograph, but must continue to act for considerable time on even the most sensitive collodion in order to create a perfect image. As any change in the relative position of the moon, the telescope, and the negative would blur and destroy the image, it is necessary to have the telescope so mounted and moved that its axis will continue to point precisely to the same portion of the moon during all the time of the exposure. In other words, photographs of the moon can be taken by means of those telescopes only which are equatorially mounted. A revolving shaft is hung or suspended in a position precisely parallel to the surface of the earth (that is, pointing to the poles of the heavens), and the telescope is secured by a pivot to one side of this shaft. A gear wheel upon the end of the shaft is then connected with the works of a very accurate clock, which causes the shaft to rotate upon its axis once in twenty-four hours. Then, if the telescope is turned upon its pivot so as to point at the sun, as it is slowly revolved by the rotation of the shaft it will continue to point toward the sun during his whole circuit around the heavens. As the sun moves toward the east among the stars about one degree daily, to follow the track of any star the clock must be made to run a little faster; and as the moon sweeps along in the same direction daily some twelve degrees, to follow its course the telescope must be made to turn a good deal slower. There are also some minor modifications in the motion of the telescope required to preserve its line of collimation in precisely the same position in relation to the moon.

The second step is to obtain a perfect focus of the actinic rays. When a sunbeam is bent from its course by refraction, the three elements of which it is composed are refracted in different degrees, the heat rays being refracted the least, the light rays next, and the chemical or actinic rays the most.

Hence, if parallel rays of a sunbeam are concentrated by means of a convex lens, the focus of the actinic rays will be nearer the lens than the focus of the rays of light. To bring the focus in the proper position to produce a perfect image of the actinic rays, Mr. Rutherford ground a lens for his telescope for the special purpose of taking this photograph of the moon. He had a large telescope equatorially mounted, and he removed the object glass, and commenced the laborious task of grinding one with his own hands, adapted to the refrangibility of the actinic rays. This labour, frequently interrupted by the tedious process of testing, occupied about two years, and resulted in the production of this most perfect photograph of the moon ever taken.—*Scientific American.*

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Proceedings of Societies.

North London Photographic Association.

The first meeting of the winter session of this association was held at Myddelton Hall, Islington, on the evening of Wednesday, October 4th. Mr. G. Wharton Simpson in the chair.

The Secretary read the minutes of the preceding meeting, which were confirmed, and the following gentlemen were elected members of the association: Mr. W. G. Parker and Mr. A. East.

Mr. H. **Cooper**, Jun., then communicated the results of some recent experiments with modifications of the organico-iron developer, (see p. 483). In the course of his remarks he exhibited a series of very charming specimens, portrait and landscape, produced by the preparation described. Some of these illustrated the result of somewhat short exposure and prolonged development, the prints being alike free from fog or hardness. Prints from negatives slightly over-exposed, the development stopped, and then sufficient intensity communicated by a little pyrogallic acid and silver had, however, a richer and more delicate texture. One print from a negative described as having very little deposit and no opacity on any part of it, being non-actinic in the lights in virtue of its colour, was much admired.

The **Chairman** said he was sure that every one present would join with him in the expression of thanks to Mr. Cooper for the interesting and valuable communication he had just made to the association. The subject was a novel one for discussion; there had been various communications in the journals respecting it, but as yet it had not been discussed in the societies. In his estimation it was one of the most important and useful subjects which could come before photographers. In his own experiments, and in the experiments of others which had come under his observation, the developer possessed advantages which must strongly recommend it to photographers. It had two extremely good qualities—one mechanical, the other chemical. Its mechanical superiority was that it flowed perfectly over the plate almost like oil, showing no tendency whatever to stains; it was also very slow in its action, which fact, in addition to its even flow, was a great advantage in the prevention of stains. Every one present was aware that in the use of the ordinary iron developer, if there were the slightest arrest in the flow of the solution, a mark on the plate was sure to follow; but with this developer the commencement of the action was so slow that even if by accident there was a slight wave, or a little hesitation in the flow, the matter could be rectified and no noticeable stain produced. Then, chemically, from its organic character, it enabled them to get a greater degree of density, a greater degree of non-actinic quality. The negative was browner and less permeable to light than when the ordinary iron developer was used. In many instances he had seen perfect printing density secured with one application of this developer without the use of any free silver or any further intensifying. It appeared to him, therefore, that with such a developer they had a subject for very interesting experiments, and probably as there had been a little difficulty in its preparation, some of the members would be able to suggest considerations in reference to it which would be useful to all.

Mr. **Bockett** asked if Mr. Cooper could prepare the solution so as to always give uniform results.

Mr. **Cooper** said he had no difficulty in working the method he had described. In adopting the way mentioned by Mr.

Carey Lea, the same tiresome performance had to be gone through each time, and always with the chance of failure; but with this solution he thought the probability of failure was very small indeed. All that had to be done was to make an iron developer in water, and then use a portion of the gelatine preparation instead of ordinary acetic acid.

Mr. Bockett said that it seemed to him in all cases where an ordinary sulphate of iron solution was made with water, after a time the developer began to decompose, and became inert.

Mr. Cooper said he presumed Mr. Bockett referred to the keeping qualities of the new preparation. He might remark that he had used a portion of solution immediately after it was made, and another portion of the same solution a fortnight afterwards, and had found no difference in the results. There was another point he might mention. Where he simply used gelatine dissolved in acetic acid, in some instances, especially if excess were added, a deposit was formed when it had stood for a day. Another difficulty followed: it was, that it was almost impossible to filter the developer; but with the preparation he had described, the solution was easily filtered, and so far retained its properties that some that he had for five weeks gave no different results than that the picture was slightly more yellow in colour. He had not found it stringy at all; the solution was almost as limpid as pure water.

Mr. Bockett asked how it would bear the addition of silver for intensification.

Mr. Cooper said he had forgotten to mention that, if a small proportion of silver only were added, the development might be continued without any more of the gelatine preparation or restraining acid. For ordinary intensification he used some of the same developer, sometimes adding one drop of a solution of nitrate of silver. If, however, more intensification than usual were necessary, he added a few drops of silver and a little of the gelatine preparation, and by using this he could intensify to any extent without danger of fog.

Mr. Bockett could not see what was gained by the use of acetic acid, seeing that Mr. Cooper had such a restrainer as sulphuric acid.

Mr. Cooper replied that the sulphuric acid was neutralized by the sulphate of ammonia; the only restraining action he had was from the glacial acetic acid and what might, he supposed, be called the glycocine formed by the sulphuric acid and gelatine.

Mr. Foxlee asked whether there was any tendency to fog with a very old bath.

Mr. Cooper said there was not. With some of the pictures exhibited he had employed a bath which had been in use since September [1864, we presume]; in fact, fogginess was almost obviated. He might also mention that the negatives became more intense in drying than ordinary negatives with which protosulphate of iron had been used. The Chairman had called attention to a slight difference of colour which he had observed. He (Mr. Cooper) had not noticed this to be the case in his experience; he could, however, get a brilliant print from an apparently thinner negative, which would indicate a more non-actinic colour. On one of the pictures exhibited there was hardly any deposit, even in the highest lights. Using a negative of that character, of course the printing proceeded very rapidly. In reply to a question, he added that he used ordinary sulphate of iron; he had tried double, and also a kind of triple salt, but did not find any advantage.

Mr. Hooper asked if the development were longer.

Mr. Cooper said the actual development in all cases was longer, and that was one of the great advantages of employing his solution, as it enabled the operator to have the most complete control over the process. It was very convenient also in a mechanical way. Very often, while developing, it became necessary to examine the negative in order to see the progress of the operation, but in ordinary cases to hold it up to the light would result in a mass of streaks. With this developer there was no tendency of that kind.

The Chairman said a few days previously he was in the studio of Mr. Jabez Hughes, at Ryde. He found that that gentleman was using the modification of this developer which he had recently published (see p. 385), in which the gelatine had been first dissolved in acetic acid, and then the ordinary solution of sulphate of iron added in place of the restraining acid usually adopted. Mr. Hughes had been employing this developer for the last two months, and he spoke of it as the best he had ever known for facility of operation and excellence of results. He (the Chairman) saw a large number of portrait and landscape negatives that Mr. Hughes had produced, which all possessed those excellent qualities Mr. Cooper had spoken of. In landscape work the fullest possible amount of intensity was obtained at once in almost every case, and when the negatives were dried they were remarkably non-actinic in the lights, and excellent in every respect.

Mr. Cooper said another and very great advantage was that the negative did not lose intensity upon being varnished. He had not met with a single instance in which the film had split upon drying; on the contrary, it appeared more firmly attached the to the glass than when ordinary solution of iron was used.

Mr. Bockett remarked that the splitting of the film generally took place from over intensification and also from the collodion being somewhat old. As he understood that by the use of this developer no after intensification was necessary, the risk of splitting would be lessened.

Mr. Cooper said that this would no doubt be the case; still the development occupied longer than it would to develop and intensify the picture by the ordinary mode.

Mr. Bockett said he always fancied that the nitric acid, liberated from the nitrate of silver, itself had a great deal to do with the breaking up of the film; and if this were so, in proportion to the greater quantity of nitrate put in to bring up the negative, was the danger of losing the film.

Mr. Cooper said that, moreover, that case a very coarse and loose deposit was obtained, which tended to split the film.

The Chairman said this was a subject which it would be well to bring before the Association again for consideration. Many of the members would probably try the developer, which was simply made, and evidently possessed many advantages. There could be no question that, with experience, some very interesting results would be obtained.

Mr. Bockett suggested that the subject should be resumed at the December meeting; and he promised in the mean time to make some experiments, the result of which he would then communicate. He said he knew that some persons had been withheld from employing this developer, having heard that such different results were obtained.

The Chairman said he had a strong opinion that much of the want of success had arisen from photographers adopting Mr. Carey Lea's formula up to a certain point only, and not being careful to neutralize the sulphuric acid with acetate of soda, as he recommended.

Mr. Barnett asked whether, in fixing, Mr. Cooper used hyposulphite or cyanide?

Mr. Cooper said he always used hyposulphite of soda.

The Chairman said Mr. Hughes invariably used hyposulphite, and not cyanide; he wished every photographer would do the same.

Mr. Cooper said if any of the members desired to make an experiment, and did not like the trouble of preparing the gelatine solution, he should be very happy to make them a present of a little.

The vote of thanks to Mr. Cooper was cordially adopted, and the suggestion of Mr. Bockett to resume the subject at the December meeting was put and agreed to.

◆

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, October 11th, 1865.

A few days ago, on my way to Bordeaux, where I was going to visit the exhibition opened by the Philomathic Society, I had occasion to call for a few minutes on M. Gabriel Blaize, of Tours. The carbon pictures which that gentleman has exhibited at the Palace of Industry, and which have been so justly admired, made me very desirous of becoming acquainted with their author, and of obtaining from him some information with respect to them.

M. Blaize's studio has not the luxurious appearance of Parisian establishments, and, indeed, that would be quite out of place in a provincial town, but it is arranged with taste, and especially with intelligence. It is at once evident that M. Blaize loves his art, and that he knows how to turn to account all the resources which the light offers to a skilful operator. His reception-room is modest, but, unlike many such rooms in the provinces, it is not hung with pictures bought of our principal photographic artists for the purpose of deceiving the local public. The pictures I saw there, and many of which were about to be sent out for delivery, are quite as perfect as those of our masters; but what principally excited my admiration were those beautiful carbon images which excel all that has hitherto been produced.

M. Blaize simply employs the bichromated gelatine process of Poitevin, with the modification introduced into it by M. Fargier; only, when the image is obtained, he covers it with a glass, so that, for the washings, it is between two glasses. The whole secret of the perfection he obtains in the result lies in the care with which he operates.

The author does not make a trade of these images; and indeed he declared to me that, in the present state of things, the process, however perfect from the artistic point of view, is not industrially practicable. The indecision existing with respect to the necessary duration of the exposure, which varies according to the most inconstant climacteric circumstances, and of which it is impossible to judge, seeing that the image is invisible till the moment when the carbon is spread over it. The difficulties arising from the nature of the colouring powder employed, and those to be overcome in the washing and the transfer of the image, render this method impracticable for rapid printing on a large scale.

Such is the opinion that a practician has derived from his own experience. However, the excellence of the process is established, and further practice cannot fail so to modify it as that these inconveniences shall disappear one by one.

The Exhibition of the Philomathic Society of Bordeaux contains a somewhat large number of photographic pictures. Several Parisian photographers—Messrs. Frank, Bondonneau and Keu, Mulnier, Reutlinger, Guenvin—have sent contributions. The Bordeaux portraitists are nearly all represented there, and vie with their Parisian brethren. I remarked several very successful amplifications by Provost of Toulouse, Perlat of Poitiers, and Honoré of Calais. The two last-mentioned employ the apparatus of Mr. Liebert, and that with success. There are also several essays in enamel photography, and in photolithography, which prove that these methods are spreading wide.

But of all the photographers represented at this Exhibition, he whose works offer the most interesting *ensemble* is certainly M. Terpereau, M. Frank's son-in-law. This young man has been charged, by the city of Bordeaux, to execute views of all the public buildings about to undergo modification, of the quarters doomed to demolition, etc. The Railway Company of the South, too, has charged him with the reproduction of all the works they are having executed on their important territory. M. Terpereau is very able and very laborious, and his collection is certainly one of the most remarkable which photography has yet produced.

You have, doubtless, heard speak of Arcachon, a town which has arisen within the space of three or four years on the shore of the ocean, and in the midst of a forest of pines. It is the Railway Company of the South which has produced this prodigy. It has scattered delightful villas in the thick of the wood, has constructed a marvellous casino in Moorish style, and is every day enlarging this fantastic town.

M. Terpereau has had for several years past the mission of reproducing these works as they are executed. He has thus been enabled to compose a charming album, which is increasing every day. I have seen his mode of operating, and cannot but recommend it. All his products, apparatus, &c., are contained in a small vehicle which serves him as a laboratory. It has the shape of a large oblong trunk, is borne on four small wheels, and can be drawn with ease by a young boy. It opens like a cupboard, and the photographer, seated on a folding-stool, places himself between the open leaves, and a black curtain envelopes the whole affair. The light is admitted into the interior through the yellow glass of a small aperture. The bottles, the dishes, the glass-plates, the water-tank with draining-pipes, are all arranged regularly within this portable laboratory, in which the manipulations are carried on as conveniently as in an operating-room.

The objective employed by M. Terpereau is a Dallmeyer triplet, and I can affirm that he makes excellent use of it, for during my whole stay at Arcachon I did not see him recommence a single picture, whatever the unfavourable nature of the light or of the position. To give an idea of the attraction which photography offers wherever it is met with, I will add that M. Terpereau never takes a view of one of the villas constructed by the Company, without being requested by the occupants of the *châlet* to photograph them in group at the same time. This, in addition to its increasing the profits of the operator, gives greater animation and interest to the pictures of his album.

Ernest Lacan.

ENLARGEMENTS AT THE NORTH EASTERN LONDON PHOTOGRAPHIC EXHIBITION.

Sir,—This branch of the art (which it is so desirable to advance) holds a higher position in the above Exhibition than it has ever held in any previously. This being the case, I cannot help thinking that it is to be regretted that the jurors did not find any of sufficient excellence to justify them in awarding a medal. However, upon reading the report, it appears that there are some of "fair average excellence." Which these were is not stated; but from what follows, they appear to have been those printed out upon albumenized paper, thus affirming the excellence of chloride of silver *versus* iodide of silver. But to proceed. The report further states that "these were found when they came under the attention of the jurors to be exhibited, not by producers, but by agents or dealers, and were thus disqualified for receiving attention." This doubtless was the case with most, though not with all; and although enlargements on chloride of silver have been regarded as almost an impossibility in smoky London, nevertheless, I beg most respectfully to draw the attention of the jurors and photographers to the fact that the three enlargements exhibited by myself were printed out direct, and that with great ease (in that most frequented street at the West End, "Regent-street").

If not trespassing too much upon your valuable space, I will at once give a brief account of my proceedings.

There is not much novelty in the manner of producing these negatives, it only being necessary to pay attention to a few details.

In the first place the collodion. This perhaps is the most important item in the production of the proper kind of negative. Ordinary collodion does not suit at all, so I at once set to work to obtain what was necessary, viz., a thin, horny, textureless collodion, giving a brilliant image. A strongly bromized sample was tried, but with only partial success. This difficulty was overcome entirely by a sample furnished by Mr. Swan of Newcastle, to whom I wrote describing the sort I required. In a few days a sample pint was sent, which answered my purpose admirably. I proceeded in the usual way, using a nitrate bath, 35 grains to the ounce, with rather an excess of nitric acid. The exposure is of the utmost importance; great care must be taken not to under expose, for if this is the case, a coarse, hard enlargement is sure to be the result. The iron developer should be rather weaker than usual, and great care must be taken to stop development the moment all detail is out. Fix in hyposulphite of soda, and varnish with a thin, hard, brilliant varnish. A dull varnish will retard the printing.

This negative is then placed in position in the camera, which is moved, from time to time, so that the sun may strike upon the centre of the condenser. Another important point is, to be careful to take the negative in proper proportion, so that the sun may be brought to a focus at a convenient distance, when producing the proper-sized image. I may add here that I do not use a reflector, the sun being admitted direct through the condenser.

As regards the time required for printing, I am convinced a good class of negative will print in one hour. I have printed as many as three in one morning. One of those in the Exhibition—"The Lady"—was printed in eighty minutes, the "Gentleman" in an hour and-a-half, and the vignette head of the Gentleman in two hours and a-half; this latter being an old and rather dense negative. Thus I am convinced that printing out direct, either on salted or on albumenized paper, is not at all impracticable: in fact, on salted paper it is even more rapid. The paper I use is always sensitized on a strong silver bath, and afterwards fumigated with strong ammonia. The washing, toning, fixing, &c., are effected in the usual manner.

In conclusion, let me urge my photographic brethren to take courage and go forward, remembering the Greek proverb, Μελέτη τὸ πᾶν—nothing impossible.

George Hooper.

"*Sponsalia*," 246 *&* 248, *Regent Street.*

SKIES IN LANDSCAPES.

Sir,—I have just laid down the Photographic News of August 25, after reading on page 407 the article "Skies in Landscapes," with your appended suggestion of "some plan for limiting the exposure of sky, whilst giving sufficient to the foreground."

When I was in the practice of photography—

Ah! woful *when*,
Ah! for the change 'twixt now and then—

I used, with a success that should have been improved, a method of "stopping out" in development, points of high light, on which detail would have been lost by the protracted development of the rest of the negative. It was simply tincture of guiacum applied carefully with a camel's-hair pencil to such points, the plate being of course dried to receive it. This dries immediately, and will resist effectually any further action of the developer upon the parts covered by it. When the development is complete the guiacum is instantaneously removed by a little alcohol, before the plate is fixed. The difficulty in using it is obviously the delicacy and steadiness of hand necessary to prevent the extension of the guiacum beyond the exact limits to which it should be applied; but this would hardly exist in stopping out a sky, a purpose for which I never tried it, but one for which it seems peculiarly useful. It is applicable only to dry processes. The Photographic News is now almost the only hold I have upon the art which I practised enthusiastically and successfully a few years ago. The past two years have seen me most reluctantly give it up as encroaching upon more important occupation. I was very successful in improvements in the albumen process, of which I published in 1858 a "Manual for Amateurs," which was very kindly received in England, and noticed in the Photographic News.

Geo. B. Coale.

Baltimore, Sept. 18, 1865.

[It gives us much pleasure to publish the suggestion and receive the kind words of our transatlantic friend, whose name is very familiar to us.—Ed.]

ENAMEL PHOTOGRAPHS.

Sir,—I read with great interest your comprehensive article in the last number of the News relative to an enamel process that comes to us from Germany; and my name being introduced in your comments, as the patentee in England, of a process for producing the same sort of pictures, will you kindly allow me, through the medium of your columns, to try and throw a little light upon the origin of the German process lately brought out by a very respectable firm of Manchester, Messrs. Dale and Co., probably in ignorance of my patent.

After being engaged for a considerable time in experiments tending to obtain, *photographically*, permanent transfers of photographs, or any sort of pictures in ceramic or enamel colours, on glass and on china, to be fixed by fire, I found, on inquiry, that the process was entirely novel in this country, and likely to become in course of time of general application for decorative and other purposes; I also felt convinced that before I had perfected the process to my complete satisfaction, it would necessitate a large expenditure of time and of money, and that it was therefore a proper case for securing the invention by a patent. In January, 1860, I applied for and was granted a patent for the United Kingdom and dependencies.

A year or two after this, I had an opportunity of sending some specimens of my process to Munich, to the great chemist, Professor Von Liebig, who conveyed to me, through a friend, his warm approbation of the success of my labours. Later still, I received a letter from a gentleman in Munich, asking upon what terms I would communicate my process, and give the right to exercise it, saying, that some persons at Munich had been attempting to produce enamel photographs, but without any result. My answer was that, as I had not a patent for Germany, anyone was at liberty to use my process; and in order to facilitate this, I sent a copy of my specification. Strange to say, I never received another communication from the party; but I am under the impression that it is not unlikely my specifications have been the means of enabling the German inventors to work out the process attributed to M. Obernetter, which I do not hesitate to consider as an imitation of my patented process, and about which I shall take an early opportunity, now that I have returned to town, to consult some competent counsel on those matters.

It would be absurd in any one to rest a claim in an invention upon the well-known properties of salt of chromic acid, or of any saccharine substance or other ingredients which I use in my enamel process, but the legislation of this and other neighbouring countries is now, happily, well established in matter of patent rights, and the application "for an entirely novel purpose of recognised usefulness, of means, or combination of means, or substances already known, constitutes a valuable case for protection under a patent;" and this is the position I and other patentees wish to assume and maintain so long as the law remains as it now is. This protection, which is only obtained after a considerable expenditure of money (the fees to Government amounting to nearly two hundred pounds), is, I might say, merely nominal to a large number of inventors, being, in point of fact, the privilege of those who can afford to expend hundreds, in some cases thousands, of pounds in law costs of all sorts, in order to defend their property from invasion; but such as it as, though I am no advocate of the system of granting patents as at present in force, it may be better to retain it until something better can be devised; and it is almost certain that if the patent laws were repealed altogether, as some modern reformers would advise it, the great majority of hard-working men of science, who toil incessantly for years of anxiety and sacrifices sometimes in order to bring out a useful invention, would perhaps hesitate before embarking in expenses which there would not be for them any possible prospect of ever recovering.—I am, sir, yours, &c.,

F. Joubert.

36, *Porchester Terrace.*

THE NEW METHOD OF RELIEF PRINTING.

Sir,—Your allusion to Mr. Swan and myself in your article on the Patent Laws, although styled by him unfortunate, has, apparently, given that gentleman just the opportunity he wanted, and has doubtless been waiting for, of renewing the controversy which took place some months ago in a contemporary journal, which was only brought to an end by the expressed wish of the editors that it should terminate, owing, I suppose, to its being of a purely personal character, and, therefore, of little interest to the public. I shall not, therefore, enter into any further discussion with Mr. Swan (having already answered all his former statements, of which his present letter is merely a reiteration), but shall confine myself to one or two statements which I think necessary.

Although Mr. Swan claims the first publication of my process as having come from himself, I think the question should be looked at in quite a different light. Had I not, during the early stage of my invention, shown you examples of the different applications of my process, you would, very probably, have had to keep Mr. Swan's secret for an indefinite period, as I find, on referring to a letter of his in your Journal for February 19th, 1864, the following remarks; after speaking of obtaining gelatine reliefs and prints from the same, he says:—

"It is a result I have been longing for and speculating how to obtain for the last twenty years."

Now, is it not just probable that another twenty years might have elapsed before Mr. Swan had perfected the results he speaks of. At any rate, I maintain that the first publication of the process was caused by my showing you the results I did; as, whether Mr. Swan had withdrawn his secrecy or no, you would have doubtless published my communicated ideas on the subject.

We see that as early as February '64, and for some time before, by his own showing, Mr. Swan had the idea, and up to February last, at least, this idea was still in much the same state.

Now, in my own case, I have already brought the matter before photographers in a practical form, although little more than twelve months have elapsed since my first experiments on the subject (having had no previous experience with the materials used); and I feel confident that the close of the year will see my process in actual commercial use for book illustrations, &c.

That the spur to exertion, in experimenting and working out the process, has been owing to the existence of the protection given by the Patent Laws, and consequent hope of future gain, to compensate for time, thought, and money expended, there can be no doubt; in fact, your article on the subject, I think, states the case very clearly, as, had we no Patent Laws, I fear we should have few inventors, and those only philanthropists.

One word with regard to my provisional specification, which Mr. Swan seems so anxious to pick to pieces. He finds great fault with what he calls the vague phrase "or other semi-transparent material," this being the very point in which the novelty of the process consists, as it goes on to state, "so that when viewed as a transparency, the varying thicknesses of material will show the picture or design."

Now, as these pictures owe their appearance to their different degrees of transparency, whether on glass, porcelain, or transferred to paper, I maintain that the wording, "viewed as a transparency," is the most suitable term to use in describing them, as in no other method of printing, that I am aware of, do the different degrees of shadow depend on the different degrees of transparency of the material forming the ink used. However, regarding the wording of this specification, I can only say that on first deciding to patent my invention, I submitted to the notice of my patent agent, to be included in my patent, the following:—

A mould in copper obtained from a gelatine relief;

A cast from the same in a substitute for porcelain, composed of wax and plaster;

A print from the same in gelatine and Indian ink transferred to paper;

And a reduced copy of a plaster cast in plaster.

The result was, the drawing up of the provisional specification to include these applications of the new principle in as simple and concise a mode as possible, leaving it for the final specification to state the minor details.

I was, and am, quite satisfied with the method in which it is worded, knowing that at that early stage it is not necessary to state more than the general principle of the object of the patent.

I have now answered such parts of Mr. Swan's letter as I thought worthy of notice, and shall leave him to carry on the correspondence himself, as nothing more could be said on the subject that has not already been stated; further discussion on the matter would, therefore, be useless.—I am, yours, &c., Walter Woodbury.

Worcester Park, October 10th, 1865.

PHOTO-BINOGRAPHY.

Sir,—In the correspondence that has taken place on this subject, I think it singular that no one has thought it worth his while to pen a line in support of Mr. Pettitt's views, except himself. It is not unreasonable to suppose that there is somebody besides himself who believes in him, but as yet no one has come forward to utter a word in his favour.

A correspondent, "Observer," has taken Mr. P. pretty sharply to task, and Mr. P. has replied, and a very lame reply I think he makes.

Without wishing to take the high hand as "Observer" does, I cannot but think that Mr. P. was wrong in neglecting to ventilate his views and exhibit his pictures to the British Association at Birmingham. If the judgment had been in his favour there would have been no need for Prof. Wheatstone's decision; and if it had been given against him he could still have fallen back on the learned electrician. But supposing Wheatstone's opinion is adverse, how then? Will he (Mr. P.) confess he is wrong, and publicly acknowledge his error? Or will he turn round and sneer at him, and make unhandsome insinuations at him, as he has done at you, sir?

As I said before, I really should like to hear somebody else say something about his views besides himself, if there be any converts. I dare say many of your readers saw his pictures when exhibited this summer at the Exhibition in Conduit-street. I had a good look at them myself, and although I thought they were peculiar and had some good points, I could not detect a tithe of the virtue in them that Mr. P. says they possess. I remember the occasion very well when I first saw them. I had walked into the Exhibition one afternoon, and was looking casually round to see if I could detect any novelty, when my eye fell on Mr. Pettitt's three pictures. They were hung rather high, and I could not get a very good look at them. At first, I thought they were large glass positives; then, from their peculiar colour, I thought they were developed prints. I was passing away from them, not deeming them worthy of much thought as to what they were, when a gentleman, evidently an enthusiastic admirer of the art, asked me if I had seen the "Binographs." I replied, "No; where are they, and *what* are they?" "Here they are," said he, pointing to the three pictures I had just left; "they are going to produce a revolution in photography. The inventor is going to deliver a lecture on them at one of the Scientific Societies. It will create quite a sensation." With this I went and had another good look at them. They had a dim, misty, ghostly look. They certainly were not sharp, but had a sort of "moved" appearance, or as if they were out of focus, or had been taken with a bad lens that had no focus. One of the pictures, a young woman's head, I rather liked; but the others were too dark and misty. They were much of the character of some of those dreary pictures of Mrs. Julia Cameron's. At another part of the room was an enlarged head of Alfred Tennyson, done by Mayall. This picture I took up and placed it as near as I could to the three nondescript ones; I stepped back so as to see them all at one glance, and though Mayall's picture had not the hazy, out-of-focus softness of the others, yet in brilliancy, vigour, boldness, tone, and all the good qualities that make a large picture valuable, it (Mayall's) out of all proportion surpassed these three dreary, hazy ones. I put the Tennyson head back in its place, and mentally wondered how any sane man could suppose these so-called "binographs" could be other than comparative abortions.

These, sir, were my first vivid impressions. I have since read what he has described of them, and I charitably conclude that the whole thing is an hallucination; that the inventor, who otherwise writes like a sensible man, is a little shaky on this point. Therefore I write to know if any one else has been bitten, or whether Mr. Pettitt is happily the only one afflicted with photo-binography-mania.—Yours truly, T. E. P.

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Photographic Notes and Queries.

Blisters on Albumenized Paper.

Sir,—During the last month or two I have unfortunately had a good many opportunities of observing the phenomenon called "Blistering" in albumenized paper.

It seems to me that the cause to which it is usually attributed, viz., unequal expansion of the paper and the albumen, does not wholly account for it, as I find that however long the paper remains in pure water, it never "blisters," but only after being immersed in the "hypo."

I have always found that the paper remains unaltered until taken out of the "hypo," and then, on contact with the first washing water, it becomes covered with "blisters" almost instantaneously.

Is it known how it is that the "hypo" causes this singular change? and is there any remedy for it?

I have frequently seen in your "Correspondents" column a recommendation to use "Saxe" instead of "Rive" paper, as being less liable to this defect; but in practice I have found the "Saxe" paper blister quite as much as the "Rive."

This morning I saw an old print completely covered with a network of cracks in the albumen. Is it not likely that this was caused by "blistering?"

With thanks for much useful information through the News, I remain, Sir, yours truly, Quarto.

Sept. 27, 1865.

[The subject of blistering, either as to cause or cure, is not well understood. It is most common with *Rive* paper, but sometimes occurs with *Saxe.* It is attributed by some to the extremely dry condition of the paper before sensitizing, and it is recommended to keep the paper in a damp place for an hour or two before sensitizing. Some attribute it to alkalinity in the hyposulphite solution. We have noticed that the tendency is very much reduced if the prints be kept immersed, face downward, in the fixing and washing baths. If the albumen surface be suffered to float exposed slightly above the surface of the water, blisters are more likely to occur. We do not think that the reticulation you describe is the result of blistering; but probably arises from the paper getting thoroughly dessicated before it is used. Nevertheless, if paper be kept long damp it spoils.—Ed.]

Decolourizing the Nitrate Bath.

Sir,—Knowing the importance of space in your columns, I will only ask you to permit me two or three lines in respect to Mr. D. C. Chapman's new method of rectifying discoloured printing baths. I think his mode one of much trouble, for it would take nearly all one's time to get a discoloured bath into a clear working state. In respect to kaolin I do not agree with him, as in my experience it is very valuable in securing quick clarification.

My mode of using it is as follows:—When the old printing bath gets discoloured I add to 40 ozs. of nitrate bath 1½ oz. of kaolin; this I keep in a stock bottle; I shake it well up, and within four hours it is as clear as possible. I then pour it in the filter, decant it without any disturbance of kaolin whatever; and, in fact, after filtration it seems as clear as shown when fresh made. I have kept the kaolin in for six weeks, and when the sensitising is done, I pour back the said solution into the stock bottle, give one shake, and it is as clear within six hours after shaking as at first, and is again ready for the next morning. I also wish to state that I have not found it injurious in any way. My bath which I use is not more than 35 grains to the ounce, and my paper always seems to print and tone very rapidly. I have enclosed you a print for your opinion.—Yours very faithfully.

October 3rd, 1865. One who is open to a Wrinkle.

[The portrait enclosed is a very good specimen of printing.—Ed.]

Negatives Sensitive to Light.

Sir,—One evening, during the last week, I applied iodine to two weak negatives for the purpose of intensifying them, after which they were placed unintentionally in close contact the one to the other on a shelf, exposed to light. To my surprise, on the following morning, I found a vigorous and perfectly defined image of the front one imprinted on the other,—so defined, indeed, as to lead me to the conclusion that it had destroyed the original image of this negative. I had intended to have taken a print by way of experiment, but leaving it still exposed to light, the image gradually faded away, leaving the negative with its own image again perfectly clear.

This incident, novel and interesting to me—a young photographer—perhaps may not be uninteresting to others more experienced in the art, and concerning which I am disposed to learn something further.—I am, sir, yours truly,

William Short.

[The image being partially converted into iodide of silver, becomes of course sensitive to light, and hence, when exposed in the way described, the image of the outer negative was impressed on the film of the other. When the inner negative was exposed altogether to light, the whole surface would be affected, and a slight darkening ensue, thus causing the image to disappear, or, as our correspondent expresses it, to "fade away."—Ed.]

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Talk in the Studio.

Photography and Art.—"The Associated Arts Institute," formerly known as "The Art Quibblers," re-opens its proceedings at the gallery, 9, Conduit Street, Regent-street, on the 24th inst. The chair will be taken by the President, Richard Westmacott, Esq., R.A., F.R.S., &c., &c. An opening address will be read by Mr. A. H. Wall. At the following meeting the exhibition of competitive sketches and photographs illustrative of the word "Solitude" takes place, and at the two successive meetings papers will be read "On the Cartoons of Raphael," by a well-known and eminent painter; and on "The Uses of Photography to the Artist," by Mr. O. G. Rejlander, both of which papers will be largely and effectively illustrated by the aid of photography.

Unequal Intensity in Negatives by the New Developer.—Our esteemed correspondent, Mr. Burgess, of Norwich, writes as follows:—"I have frequently found, since using the gelatino-iron developer, that on varnishing the negative, some parts remained more intense than others (generally little patches on the background), apparently arising from the varnish not having penetrated at those parts. A second application of the varnish always causes these more intense patches to vanish, and a prolonged washing before drying avoids them altogether. Perhaps this will be of service to G. U. N., and any others who may have met with a similar effect.

Magnesium Light for Copying Paintings.—We understand that Mr. Thurston Thompson has recently photographed Maclise's "Death of Nelson," recently finished in the Royal Gallery at Westminster. The light was supplied by burning magnesium, the lamps used being those of Mr. Solomon.

Copying one Picture by many Negatives.—Messrs. Cundall and Downes, in a recent copy of Herbert's "Descent of Moses from Sinai," obtained the picture by no less than twenty-one negatives, the prints from which are joined with great success, so as to form one harmonious picture.

Mr. Rouch's Medal.—By a printer's error in the list of medals awarded at Dublin published in our last, the medal given to Mr. W. W. Rouch is announced to be given to Mr. Rough. Mr. Rouch's name is sufficiently well-known to photographers to prevent the error misleading many.

The New Developer.—Mr. Cherrill suggests that the indication of the presence of free sulphuric acid in the new gelatino-iron developer will be imperfect development and the production of black spots in the negative.

Photographs of the Eclipse of the Moon.—At a recent meeting of the Photographic Section of the Literary and Philosophical Society, Mr. A. Brothers submitted a valuable series of instantaneous photographic negatives, taken by him during the progress of the late eclipse of the moon. The total number of negatives is twenty, of which sixteen represent the progress of the eclipse. An attempt was made, by the exposure of a one-plate for fifteen seconds, to obtain the darkened limb of the moon, but no photographic action resulted. In mentioning the name of Mr. Brothers we are reminded that his name is mentioned in the report of the photographic jurors at Dublin, in connection with some complimentary remarks on his photographs by the magnesium light, as "Messrs. Brothers," instead of Mr. A. Brothers.

PHOTOGRAPHS OF THE CHINESE GIANT.—The London Stereoscopic Company have just issued a series of capital photographs of the famous Chinese giant, *Chang*. Some in which the wife of the giant is portrayed by his side give a more striking illustration of his immense proportions than could be effected by any other method; others with the dwarf by his side give a ludicrous effect to the pigmy stature of the latter. We understand that it is the intention of the Company to have one of the portraits enlarged to life-size, 7 feet 8 inches, thus obtaining the largest photograph which has probably ever been produced. The excellence of the card pictures affords facility for a very fine nelargement.

ORIGIN OF PHOTOGRAPHY.—In connection with this subject, to which we have referred once or twice lately, we may mention a piece of collateral evidence which recently came under our attention, which strongly aids in establishing the claims of the Rev. J. B. Reade to the use of gallo-nitrate of silver some years before it was patented by Mr. Talbot. Mr. Reade told us that one of his early photographs, produced in the solar microscope on the paper prepared with chloride of silver and washed with an infusion of nut-galls, was an enlarged copy of a flea, which he gave at the time to Mr. Akerman. Mentioning this circumstance to Dr. Diamond, he stated that the same photograph was given by Mr. Akerman to him the Sunday on which King William IV. died, the circumstance being impressed on his mind by hearing, shortly after receiving the picture, the bell of St. Paul's toll, and the exclamation being made that some member of the royal family must be dead. This, it will be remembered, was in June, 1837. The photograph in question, Dr. Diamond states, had all the peculiarity of the early developed prints.

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To Correspondents.

A BEGINNER.—Erect your studio so that the north side is glass, and let the background be placed at the west end. The whole of the north side and roof may be of glass; but under the circumstances you describe it will not be important to make any portion of the south glass. We cannot give you more definite instructions from a mere description of the place. You will find many valuable hints on the erection of glass houses in our YEAR-BOOK, and these you can probably apply to your own case.

E. MOSS.—We believe that the enamelled iron plates for collodion-positives can be procured of Mr. Atkinson, of Liverpool, and also of various photographic dealers. We regret that we have not time to write private letters in answer to questions of this kind.

CASTLEBERY.—Either No. 1 or No. 2 will, we believe, be good, but we give the preference to No. 2, as having the preponderance of good qualities. The trifling difference in cost would, in our estimation, be more than compensated by the certainty of satisfaction. This is our conviction. We have much pleasure in giving all the aid we can to our readers.

E. SAWYER.—The effect of the vignetting is very excellent. We shall be glad to hear something more about it.

F. D.—We regret to say that yours is not a solitary case of the difficulty of working in the glass-room described, with tunnel and front top-light. In theory the plan seemed excellent, but in practice it is found generally unsatisfactory. Several photographers we know, among them Mr. Samuel Fry, well known for his success in astronomical photography and other branches of the art, having tried the plan, have rejected it, and had their studios altered. Nevertheless, we think that by skilful management of blinds, such a form of studio might be made to give good pictures. The examples you enclose are certainly, for the most part, flat, hard, and destitute of modelling. It is probable that, by considerably reducing the amount of light, you might work nearly as rapidly, and get much better results. In all the prints there is the flatness produced by too much front light, and also by over-intensifying. No. 10 is the only portrait free from this defect. Cover with blinds one-half or two-thirds of the top-light, either on the right side or left, as circumstances may require; expose sufficiently long, and intensify less. Mr. H. P. Robinson, of 68, Canonbury Park South, is the most capable teacher of artistic photography we know, and it is possible that, if you send him a plan of your glass-room, he may be able to furnish you with a plan for the arrangement of your blinds suited to your specific case.

INQUIRER.—The statement in the *Popular Science Review*, to which you refer, is an error arising either from a slight misconception of the facts, or an imperfect mode of stating them. In both positives and negatives, fixing is effected by removing the undecomposed sensitive salt.

LENS.—The mottled brown stains to which you refer, which are only seen by looking at the back of the negative, and are in contact with the glass under the film, often arise from the use of a dirty plate. If in such case the collodion film be thick, the stain will not appear on its surface. There is another cause which, if the stain do not appear until after intensifying, is most probably the cause in your case. It is probable that you have fixed the negative with hyposulphite of soda, and have not sufficiently washed it to remove all traces of the hypo before drying. When, therefore, you apply a solution of pyro and silver to intensify, the silver comes into contact with traces of the hypo left lurking between the film and glass, and a decomposition resulting in a brown stain at once ensues. With the remaining negative, in order to avoid this, wash it carefully; next treat it with dilute solution of iodine; wash again well, and then proceed to intensify. 2. In the Enlarging Camera, described by Mr. Burgess in our pages, no condenser is used. In enlarging, any lens may be employed to enlarge, even to life-size, but the No. 1 Triple, as described by Mr. Burgess, is most suitable for the work, and effects it best. The size of a plate covered by a lens is decided by its length of focus; and in enlarging, the focus is practically lengthened enormously. So also in ordinary work, in taking near objects, such as interiors, the focus is lengthened, and a lens which in such case may cover a 10 by 8 plate, may not, for ordinary landscape work, properly cover more than 7¼ by 4½, especially with some classes of subjects.

P. JONES.—Your plan is generally excellent; we should, however, prefer 4 feet more glass in sides and roof, so as to have more light available in dull weather.

NELSON K. CHERRILL.—The custom of cleaning plates with nitric acid is, we believe, very common in the United States, and is also used by many persons in this country; and we fear the practice of following this by an alkali is not so invariable as it should be. It is to this practice the Editor of the *American Journal* refers, and remarks that any alkali (spelled in America alcali) will remove the acid retained by the plate more effectually than water. The extract describing the muddle with the gelatino-iron developer, which you enclose, is amusing enough. Thanks.

X. Y. Z.—Mr. Henry Claudet's communication on the use of formic acid in the developer appeared in the PHOTOGRAPHIC NEWS of July 18th, 1862; a further communication from the same gentleman appears in the NEWS of May 8th, 1863; and a comprehensive article by ourselves appears in the number for June 12th, 1863. Several communications on the subject appear in the same volume.

PHIDIAS.—See answer above to X. Y. Z.

ALFRED.—The articles by Mr. Lake Price on composition occur in the PHOTOGRAPHIC NEWS, from February 17th to May 25th, 1860; but the whole of the numbers are not in print. 2. It is not generally necessary to filter the organic developer made after Mr. Hughes's formula.

R. H. W. INGRAM.—The electric light in any form would scarcely be available for general use in a private room. Such an electric light as we have at times described for photographic purposes costs two shillings per hour, and the trouble, &c., would be great. It is only available for specific scientific purposes. Dr. Golding Bird's work on "Natural Philosophy" will inform you on the subject. Mr. Highley, of Dean-street, Soho, can inform you of the cheapest form in which it can be supplied and used.

W. H. F.—On reading the communication in question carefully you will find that the toning qualities of the solution described are best when it has been made ten minutes, but that it may sometimes be used next day. It can, of course, be used over and over during the time it retains its activity, but it soon becomes inert.

AN ARTIST wishes to state that in referring to "an article" on "Poets and Painting" by an academician, he should have said "articles." As the subject has already occupied sufficient of our space, we cannot open it again to the discussion of whether *pure* blue or purple is seen in distant mountains, &c. The question of *pure* blues, &c., seen in the distance, is raised for the first time in "An Artist's" letter. If we insert it, we shall doubtless be asked by "Respice Finem" where *pure* colours are to be obtained; and since "An Artist" regards blues and purples as definite tints, he may ask which blue pigment shall represent blue, whether ultramarine, cobalt, smalt, Prussian blue, indigo, &c. As all this is quite beside the question discussed, we must decline to open a fresh dispute on subjects unsuited to our columns.

OLD PHOTO.—The only plan in such a case is to discard the faulty bath. 2. The patches of irregular density are doubtless due to the use of the organico-iron developer, with a little too much gelatine, and not thoroughly washing afterwards. Portions of the gelatine adhering to the surface cause the varnish to be irregularly absorbed by the film, and thus patches of irregular density arise. See a suggestion by Mr. Burgess in our "Talk in the Studio" column. 3. It is not imperative that collodio-chloride prints on opal glass should be washed before toning, but it is as well to wash them a little. 4. It is not necessary to varnish them. 5. If albumen be used, it should not be salted. 6. See an article on the subject of managing the nitrate bath in our YEAR-BOOK for 1864.

AN AMATEUR.—Such an illustrated series of articles as you suggest on Composition and Chiaroscuro have already appeared in our columns, written by Mr. Lake Price, in the early numbers of the year 1860.

E. WILLS.—Photography is generally spoken of as a profession; whether it would be regarded as a profession or trade in the eyes of the law, we cannot state. The payment of witnesses in matters of this kind is somewhat arbitrarily managed, and often inflicts considerable loss on them. Your remedy is difficult to obtain after the matter is over; but you can refuse to give evidence until your expenses are paid. This is, however, a question beyond our province, and we cannot give you efficient advice.

DEVELOPER.—Your progress is very creditable for so short an experience. Your arrangements appear as convenient as the circumstances permit. Your background is a little too light in colour for the best effect, and your lens does not cover very well. The sticking of the paper to the negative results from the varnish either not being sufficiently hard, or the negative being used so soon after the plate is varnished. The numbers referring to the prints in your letters are omitted.

T. H. REDIN.—Mr. Burgess's suggestions, in another column, explain, we think, the irregular markings which have been observed by some with the gelatino-iron developer. The print enclosed, as the result of the addition of honey, is very clean and brilliant. Mr. Redin recommends to amateurs the addition of a teaspoonful of honey to sixteen ounces of developing solution. He added this to a developer containing sulphate of potash, mentioned some time ago in our pages, and finds the result excellent. We also can endorse his remarks as to the use of honey, both in making the developer flow well, and in giving clean, dense negatives.

A CONSTANT READER.—The stains in prints A, B, C, and D are the result of imperfect fixation, or using old and acid hyposulphite. The small spots on the prints marked with a cross are, some of them, the result of imperfect fixation, and some of imperfections in the paper. 2. Your washing arrangements are bad. Long soaking is always an evil; constant changes of water during four hours will wash more perfectly than three or four changes and soaking for twenty-four hours. It is a good plan to keep changing the prints every half-hour for four or five hours, draining thoroughly each print before immersing in fresh, clean water.

LUCAS AND GROOM.—Received, and shall be noticed shortly.

S. S. CAEWNSON.—The prints show a marked improvement, and are very excellent; round, delicate, and full of fine gradation, they are altogether good pictures. We are glad that our hints were so productive.

Registrations and several correspondents in our next.

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THE PHOTOGRAPHIC NEWS.

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MODIFIED FOTHERGILL PROCESS.

It is not a little remarkable, as we have more than once observed, that the first dry collodion process invented, the collodio-albumen, continues to the present time, with slight modifications, the most trustworthy method of preparing dry plates. The one drawback it possesses is the extra trouble in preparation, which arises from the necessity of a double operation. Hence the greater simplicity of the tannin process, notwithstanding the uncertainties which attend it in some hands, constitutes to persons of limited leisure a merit which gives it an advantage over the older process. The modification of the collodio-albumen process, known as the Fothergill process, although sufficiently successful in some hands, to make it for some years a favourite process, was still attended with uncertainty. The amount of albuminate of silver formed in the film and the consequent quality of the negative, depended so much upon modes of manipulation which could not well be made definite, that much variety in result was common, and the process fell gradually into disuse, except in the hands of a few in whose practice success was the rule rather than the exception. Various attempts have been made to obtain a more definite amount of silver in the plates than that left by a certain amount of washing, of which the most successful was that proposed in our columns in February, 1861, by Mr. Bartholomew, a gentleman to whom photographers are indebted for many excellent suggestions in dry-plate photography. This plan, which was subsequently independently suggested by Mr. Hannaford, consisted in giving the plates a perfect washing, and then treating them with an albumen solution to which a small portion of nitrate of silver had been added, the precipitate of albuminate of silver first formed being redissolved by the albumen or by ammonia in the solution.* It will be readily seen that more uniform results could thus be produced. In the ordinary Fothergill process, an uncertain amount of nitrate of silver was left in the film, and when the albumen solution was applied to the plate, this was converted into albuminate of silver. But this being the case, it is manifest that the result at that end of the plate upon which the solution was first poured would be different to that at the other end, the solution being weakened by flowing over the plate, and combining with the silver left in the film. On the other hand, if the nitrate of silver were perfectly removed by thorough washing, and a homogeneous solution containing a definite proportion of the organic silver salt then applied, more uniform results necessarily followed. It was also found that greater sensitiveness was secured by this mode of preparation. Mr. Fothergill himself has, we believe, adopted this method, and finds a great accession of sensitiveness as the result. Still, chiefly we believe for the want of some definite formula, the method has not come into general use.

Our attention has recently been called, by Mr. Ackland, to some experiments he has been making in this direction, in which a degree of certainty and an amount of excellence and of rapidity combined, has been secured which we have not often found before in any dry process. The negatives produced were, we may say without exaggeration, technically perfect; having detail in the deepest shadows, and being free from chalkiness in the highest lights, the gradation exceedingly delicate, and the colour and general qualities of the negatives leaving nothing to desire. The first negative we saw was a test plate taken from the back of business premises in Newgate Street, containing dark red brick buildings in shadow, and a part of Christ's Church Hospital in the light; the dark brick portions, in the obscurest light, possessed detail, the stone building was perfectly modelled and free from chalkiness, and the sky possessed that character which prints a delicate tint, instead of leaving a white mass. The results more resemble those from collodio-albumen plates by Mr. Mudd, or from collodio-bromide plates by Mr. Sayce, than anything we know. The exposure had only been thirty seconds, with a lens of four inches and a quarter focus, and a quarter-inch stop. We also saw a plate developed, which had been exposed on the morning of the day on which we called. Nothing could be more satisfactory than the behaviour of the plate in development, the whole of the detail coming out gradually, but certainly, first presenting a detailed, but phantom image, and then, in the further treatment, acquiring full intensity, without the slightest tendency to spot, or stain, or fog, or defect of any kind; and, further, passing through the stages of fixing and washing without blister, or wrinkle, or any tendency to leave the plate.

There is another point of some importance in which Mr. Ackland has discovered that these plates possess an advantage over many kinds of dry plates as well as wet plates. As many photographers know, length of exposure does not always compensate for imperfection in the light. In some kinds of dry plates, Dr. Hill Norris's for instance, it is distinctly advised that they should not be exposed in a bad light, as good pictures cannot in such case be expected from any exposure. In the wet process, every photographer knows the disadvantages of long exposure in bad light. These plates will, however, yield as good a picture with fifteen minutes' exposure in a dull light as in one minute's exposure in bright light, a good quality of no small importance in many circumstances.

We should observe that Mr. Ackland is a very experienced photographer, having worked extensively almost every dry process in use; he therefore instinctively manipulates carefully; but he remarked to us that these plates seemed to require less than usual care in many respects. The cleaning of the plate was less carefully done than is common for wet plates, and, with the exception of adhering carefully to the precise proportions of the preservative solution, he used no especial care as to the materials employed. Any good bromo-iodized collodion would, he believed, answer; he had himself used their own (Horne and Thornthwaite's) ordinary wet plate collodion for portraiture. The bath, developer, &c., were such as we shall describe, but were not especially prepared for this process. He had compared these plates with tannin plates, tried under the same circumstances, and he had also tried these plates with the addition of tannin, but always to the disadvantage of the latter, the tannin having a tendency to give hardness and chalkiness.

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* It has been suggested that the effect of adding nitrate of silver to an albumen solution containing ammonia was to form oxide of silver, which was re-dissolved by the ammonia, the precipitate of albumen being formed by the nitric acid liberated from the silver, and that this was re-dissolved by excess of ammonia, the resulting solution containing albumen and oxide of silver dissolved in ammonia. We think it is more probable that a definite but complex combination takes place between the nitrate of silver, the albumen, and the ammonia. In Mr. Ackland's preparation no precipitate forme

The point of especial importance, which Mr. Ackland seems to have worked out satisfactorily, is not simply a satisfactory formula, but also a comprehension of its mode of operation. In the method adopted by Mr. Hannaford and others, on adding the silver to the solution of albumen a precipitate of albuminate of silver was formed, which was quickly re-dissolved in excess of the solution. It would be anticipated, however, from analogy, that on freely diluting the solution with water the albuminate of silver would be again thrown down. On this supposition it was believed that a plate treated with the preparation, and then freely washed, had a small portion of albuminate of silver, which permeated the film there thrown down and left in the finished plate. Mr. Ackland has found, however, that by using the proper proportions it is possible to mix the silver solution and the albumen solution without forming a precipitate, and that this mixture may be diluted to any degree with water without decomposing it, or causing a precipitate. It followed, therefore, that a plate treated with such a proportion, and then washed, might have the whole of the albuminate of silver again removed. It was this circumstance, doubtless, which introduced some uncertainty in the method, and caused unaccountable failures in some hands with a formula which was quite successful in the hands of others. It left the process, in short, in a similar state of uncertainty to the original Fothergill process, in which the amount of albuminate of silver left in the film was very much affected by the method of manipulation in washing, &c. Mr. Ackland has found, however, that an extremely dilute bath of acetic acid renders insoluble a certain portion of the albuminate of silver, and by its application secures an attenuated but even layer of the organic salt of silver on and in the film, thus leaving the plate in the best and most sensitive condition. It will be readily understood that such a process possesses the elements of certain and uniform working, and that a formula once found which gives the best results, there is little reason to fear that it will not do so in all cases. The formula with which Mr. Ackland has kindly furnished us for the benefit of our readers has in his hands proved altogether satisfactory, and he has not found it possible to vary without disadvantage.

A word before we give the details of formula and manipulation on the keeping of these plates. As the process, as we state it, has not had a long trial, we cannot give any absolute data; but assuming that the final result is a Fothergill plate in its best state, we may argue from the keeping qualities of such plates as to the probable qualities of these. In regard, then, to the keeping of carefully prepared Fothergill plates prepared after the formula in general use four or five years ago, we have a remarkable circumstance to state, which Ackland mentioned to us. In the May of 1861 he changed his residence, and a certain camera which he was then in the habit of using was put away in his new residence in a place where it was lost sight of. A few weeks ago it was found, and, with its double backs, lent to a friend. A few days after he called to thank Mr. Ackland for having supplied the backs with plates, a circumstance which Mr. Ackland at once disavowed. It appeared, however, that when the backs were put away four years and a half ago, some Fothergill plates ready for exposure had been left there, and forgotten, with the camera, and kept thus without any especial care, they now yielded good negatives.

We must proceed to give the formula and details of working as Mr. Ackland has kindly supplied them to us. A series of stock solutions are first prepared, and we may call especial attention to the simplicity of the mode of preparation employed in making the stock albumen solution, which requires no labourious beating, and keeps indefinitely.

Prepared Albumen :—

Albumen	8 ounces
Water	1 ounce
Glacial acetic acid	24 drops

Mix the acid with the water, then add the mixture to the albumen, stir together with a glass rod for one minute; then, after resting one hour, strain through coarse muslin, and to the strained liquid add half a dram of the strongest liquor ammonia.

This prepared albumen will keep good for years if kept closely corked, and is very clear and bright when the albumen water and acetic acid is nearly mixed together; but if beaten up in the usual manner, an opalescent liquid is obtained, quite unfitted for photographic purposes.

Solution A :—

Prepared albumen	½ ounce
Liq. ammonia	1 drachm
Water	4 ounces

Solution B :—

Nitrate of silver	8 grains
Water	4 ounces

Dilute acetic acid :—

Glacial acetic acid	1 drachm
Water	10 ounces

Plain pyrogallic solution :—

Pyrogallic acid	100 grains
Absolute alcohol	2 ounces

Acid pyrogallic solution :—

Pyrogallic acid	8 grains
Citric acid	2 grains
Distilled water	4 ounces

Acid silver solution :—

Nitrate silver	30 grains
Citric acid	30 grains
Distilled water	1 ounce

Coat the plate with any good bromo-iodized collodion (that used was Horne and Thornthwaite's), allow it to set well, then immerse for five minutes in a *slightly* acid bath, containing not less than 35 grains of nitrate silver to the ounce. Take out, and after draining off excess of bath solution, wash thoroughly under a tap or in a tray with frequent changes of water: drain for two minutes, then pour on and off three or four times a mixture of equal parts of solution *A* and *B*, just previously mixed (as these two solutions when mixed speedily decompose, and, if used in that state, cause fogging): then drain for five minutes. Next pour on and off five or six times the dilute acetic acid prepared as above; then wash thoroughly, drain, and dry.

The exposure for stereoscopic plates is from 30 to 40 seconds, with lens 4¼ in. focus, ¼ in. stop. As a rule, the exposure is about half that required for collodio-albumen or Fothergill plates.

To develop, moisten the surface of the plate with distilled water; then drop into the developing glass ten drops of pyrogallic solution, and drain the water on the plate into the glass containing the pyro solution. Pour this over the plate two or three times, then allow it to rest until the sky and high lights begin to appear, and are, indeed, plainly visible. Then add *one* drop of acid silver solution to the developer, and continue pouring this on and off until the detail is fully brought out (using fresh solutions if needed), but of course with so small an amount of silver but little intensity is gained; then use the acid pyro solution with from ten to twenty drops of acid silver solution added to give the required intensity.

Note.—When the developer contains silver keep it constantly moving to prevent marbling.

Fix with hypo.

No preliminary coating is needed, as there is no slipping of the film.

We may add, that in development, the principles generally recognized in dry plate photography are especially available, and that a very considerable amount of control rests in the hands of the operator. If the exposure appear to have been at all insufficient, by continued development with the plain pyro detail may be obtained. If, on the other hand, the exposure be too long—and that is always the best direction for error—sufficient contrast may be readily secured by judicious use of the acid pyro and silver solutions.

In conclusion, we should remark that Mr. Ackland expressly desired us to state that to Mr. Bartholomew, the original suggester of this method of working, his thanks, and those of photographers generally, are due for the process; and we may add that whilst acknowledging with pleasure the originator, we feel that photographers are not less indebted to Mr. Ackland for working out and freely giving to the public the minute details upon which so much of success depends.

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ENLARGING.

BY SAMUEL FRY.

There are four methods of enlargement practically used by photographers:—

1. By the direct and simple operation of using a small lens on a long-bodied camera, and drawing out the body till the right focus is obtained.

2. By making in the camera, or by superposition, a transparency from an original negative, and from this transparency an enlarged negative.

3. By the solar camera, in which the direct rays of the sun, thrown from a reflector, pass through a condensing lens, then through the original negative, and finally through a small portrait lens. The enlarged image is received on sensitized paper, and the latent image developed with gallic acid fixed in hypo.

4. By Dr. Monckhoven's process or modifications, by which the enlarged image produced as in No. 3 is received on highly sensitive printing paper, and the sun's rays being kept by means of clockwork to the reflector, fixed in the same spot continuously, the enlarged image is printed right up, and toned and fixed as usual.

We propose to devote a short space to the consideration of the merits of the above processes, with a view to arriving at something like a conclusion as to the value of each, and the circumstances under which either is available.

1st. Enlarging by the direct operation of a small lens and long-bodied camera. This plan is one that will obviously be limited to cases in which only a moderate enlargement is demanded, as it will soon be found that the lens is required, in any great amplification, to be so close to the picture being copied, that much of the light is shut off from it, independently of the undesirability of using a portrait-lens for enlarging, with the front presented to the object, much better results being obtained when, as for the other processes, it is reversed. But for enlarging Daguerreotypes, glass positives, or paper pictures to about twice their original diameter, this plan will be found very suitable, using a quarter-plate, small carte-de-visite, or stereoscopic lens, on a camera large enough for a whole-plate or 10 by 8. The No. 1 Triplet is also well suited for this purpose, but will require a longer focus than either of the above. In our own practice we employ, according to circumstances, the small C. D. V., or else a stereoscopic. The latter will give a greater degree of enlargement from a quarter-plate picture with a camera extending to 14 or 16 inches than the former, but as a smaller stop is required to produce sharpness the time will be longer. It is of great importance to place the pictures for copying in a proper light; many carry on such an operation in the open air, in order to obtain a direct front-light, as when, in the case of paper pictures, the surface has an appreciable texture, the resulting picture is made extremely coarse, if a side-light is used, from the grain of the paper casting a shadow, which is copied in a greatly aggravated form. Paper pictures are about the most unsatisfactory things (except oil-portraits) which the photographer can undertake, and yet it is often necessary to copy them; the sitter may be dead, or in a distant land, and the negative unattainable; but in all cases they should be passed through the rolling-press before operating, as this is sure to alleviate the drawbacks.

In copying, in a slightly-enlarged form, Daguerreotypes or glass positives, no special difficulty is encountered; when the Daguerreotype has a dull, faded look, from yellowness or brownish spots on the surface, which would copy black, it should be carefully wetted by pouring on distilled water, and a twenty-grain solution of freshly made cyanide of potassium, poured on and off from a measure until the spots give way under it, which they generally do in a few minutes. The plate may then be washed gently under a stream of water, and finished by pouring an ounce or two of filtered distilled water over it; then set up corner-ways on a pad of blotting-paper, being on no account touched until dry, or a mark will be found across it at the spot where the drying was accelerated or retarded. If glass positives have a defective backing, the varnish split, or in holes, it is indispensable to remedy this before attempting to enlarge.

The time of exposure will, of course, depend on the colour of the picture, the state of light at the time, and the lens and stop employed; but with a carte de visite lens as above, and ¼ inch stop, enlarging a tolerably bright positive from ¼ to whole plate might require from one minute upwards. In order to obtain a good clean picture, the bath must be unusually good to the developer also.

With a weak bath, or one overcharged with iodide of silver, alcohol, and ether—in fact, a worn bath—very poor results are obtained. A good new bath in brilliant working order, and a newly-mixed developer of 40 grains, and at a temperature not lower than 60°, gives the best picture. If one must err, it is perhaps better to have a copy or enlargement done by this process slightly, very slightly, underexposed. There is a disposition to flatness in these operations, which increases rapidly as time is given for the entire detail to come out.

The copying and enlarging of pictures is often thought to be a very commonplace thing, but nevertheless it forms a very important part of the professional photographer's duties, and the large proportion of the wretched pictures that are brought are of inestimable value to the owners.

We have next to consider the value and proper employment of the next method of enlargement, viz., by producing a transparency, and from that again an enlarged negative. We claim to have ourselves invented and brought into practical use this operation, which is extensively employed in the present day, almost unaltered from the original plan.

We were at that time engaged in photographing the moon at the Hove Observatory, and it was necessary to enlarge the original negatives for publication as a glass transparency. The size of original was ⅞-inch diameter, from which transparencies of 4 inches were made, and the final negatives from these again. Much advantage was gained in detail by making these large transparencies, as actual experiment demonstrated.

At a later period this method of enlarging was communicated to Mr. Harman, who has since used it successfully.

(*To be continued.*)

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MID-WALES, THROUGH A PHOTOGRAPHER'S SPECTACLES.

BY G. A. BEECROFT.

A bustling, eddying crowd at Euston Square, a rush for a ticket and a seat, a whistle from the guard answered still more shrilly by the impatient engine, and we are off on our vacation tour, that blissful oasis in the desert of the year. A few hours' whirl through fields lit ruddily by the autumn sun brings us to our halting-place, Shrewsbury the picturesque. Here the photographer will find food for the camera in plenty. Ready-made pictures are thickly clustered on the banks of the Severn, over which a noble bridge brings us to the Abbey Church, on which a plate or two will be well employed. Close by is a quaint old stone pulpit, overgrown with ivy, which would make a splendid picture, were it not for the hideous modern walls and cottages which cannot be excluded from the view. Our artistic friends should not forget to visit the Quarry, which, with its avenues of grand old lime trees on the banks of a rapid stream, will afford them many a pretty "bit." From this town the railroad, by no means renowned for punctuality, took us to Aberystwyth, which we made our head-quarters, and from which numerous excursions are readily practicable. On the route hither may be noticed the picturesque pile of Powys Castle, and many a deep and rocky gorge filled with clustering foliage. Aberystwyth rejoices in an old castle, with a tolerably perfect keep, which will somewhat try the powers of any photographer desirous of making a picture as well as a photograph. I need hardly advise him to bring everything with him, for little will he be able to procure here. I tried to make a bath with good silver, but with distilled water procured in the town, and the result was apparently a decoction of black-beetles! Carbonate of soda and sunning afforded little benefit, and in despair I wrote for some Hill Norris plates, which answered admirably. I could be pretty certain of four good negatives out of every five plates. I found that the most reliable form of development, when the correctness of exposure was dubious, was to bring out the detail with pyro and acetic, with very little silver, and then intensify with citro-nitrate and pyro, as in the tannin process.

A pleasant walk of a little more than a mile brings one to the ancient church of Llanbadarn-fawr, which will furnish a charming stereograph, if the camera be placed as near as possible to the further gateway. On the south-west of the church are two time-worn crosses, on which I expended a plate for the benefit of my archæological friends. The pictures here obtainable are much more picturesque under the afternoon sun, which casts a few pleasing shadows from the noble tower. A few more views may be taken by passing through the village and turning to the right, whence a bridge with ivy and foliage, under which flows a clear rippling brook, will be found to be worth a plate.

The great excursion is to the far-famed Pont-y-Mynach, or Devil's Bridge, to which there is access daily by coach, passing through a dozen miles of lovely but non-photographic scenery. Dry-plates are here almost necessary, since the descent to the falls is extremely steep and often slippery; in fact, a companion of mine had a narrow escape, for he fell and glided downwards some little way, over a most uncomfortable series of sharp stones, and only succeeded in stopping a few feet from the edge of a deep ravine. There are some capital studies of rocks and falling water to be had at the bottom, and lovely peeps through umbrageous arches of foliage on the ascending path on the right of the falls. A dark recess, called the Robber's Cave, from a legend that tells how for a long time two outlaws and their attendant nymph sought shelter here, will not escape notice; and for those who are not unmindful of creature comforts, the Pavilion of the Hafod Hotel Company will furnish well-earned refreshment. In the village of Ponterwyd, on another and favourite route homewards, will be found a lovely glen and waterfall, and likewise a most picturesque bridge with foliage.

The excursion which charmed me most was to Dolgelly, which is reached by a somewhat lengthy and circuitous route. The railroad is to be taken to Yn-yslas, then a short trip over the sands leads to the ferry to Aberdobey, whose peal of bells, though renowned in song, in reality consists of one representative of campanology, and that cracked. Then the steam-horse takes one past Barmouth, and communicates with a coach, which carries one over the remaining two miles to the out-of-the-world town itself. If time permit, it is advisable to proceed to the Torrent Walk, about two miles further, where the only difficulty the photographer will find is to choose some of the many sylvan views here obtainable. The one epithet which I can fairly apply to the scenery is comprised in the phrase, "compressed loveliness." Gushing waterfalls, avenues sparkling with glittering leaves, streams gaily murmuring over rocky beds, conspire to form a picture which haunts our very dreams.

One more spot is there which will amply reward the pedestrian who is not averse to hill climbing. Let him pass through the northern toll-gate, and ascend the acclivity on the left, till a weather-beaten guide-post points the way to Clarach. A walk of little more than a mile will bring him to the village itself, nestling in a leafy hollow. A tasteful modern church will form a charming picture from the field on the south, and a good stereograph may be found on the road, embracing picturesque cottages, from whose chimnies wreaths the curling smoke of sweetly-scented peat fires. A path on the right leads through the fields to where the little stream of Clarach casts its contents into the ocean, and then an ascent of Craiglais, *alias* Constitution Hill, reconducts to Aberystwyth.

On my return, I stayed a few days at Ebbw Vale, perhaps the largest iron-works in the kingdom, for there 18,000 men are employed, both above and underground. At night may be seen a spectacle which would gladden the heart of a poet—large blast-furnaces vomiting forth masses of dusky lambent flame, while the attendant sprites flit hither and thither like fireflies in the lurid glare, while the roar of the machinery echoes its fantastic accompaniment.

Here I will conclude, hoping that this hasty sketch may serve to point out some objects of interest to any member of the black-fingered confraternity whose lot it may be to sojourn in the pleasant vales of this portion of Cambria's fair expanse.

Christ Church, Oxon.

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ON THE PREPARATION OF PYROGALLIC ACID AND SOME OF ITS PROPERTIES.

BY M. VICTOR DE LUYNES AND G. ESPERANDIEU.

Pyrogallic acid, first examined by Berzelius and Braconnot, became in 1834 the subject of the remarkable researches of M. Pelouze, who, in discribing its principal properties, made known at the same time the laws that preside over its formation.

Through the labours of MM. Chevereul, Regnaults, and Liebig, pyrogallic acid received numerous useful applications. Its employment in laboratories to analyze the air; the part it plays in the development of photographic proofs; and its employment in dyeing the hair, sufficiently justify the important place it occupies among chemical products.

With regard to its properties and constitution, pyrogallic acid is also deserving of all the interest of the theoretical chemist. We have undertaken these researches with the view of ascertaining its real chemical nature; although our task is not yet finished, we believe that the first results we have obtained are worthy of being presented to the *Académie.*

The first point that attracted our attention was the mode of preparing pyrogallic acid. According to M. Pelouze gallic acid, heated in a retort by an oil-bath to 410° F., is completely decomposed into carbonic acid and pyrogallic acid :—

$$C^{14} H^{6} O^{10} = {}^{2}CO_{2} + C^{12} H^{6} O^{6}$$

Nothing remains in the retort, or at most only a scarcely ponderable residue.

In the above equation, 100 parts of dry gallic acid should yield 74·1 pyrogallic acid. Now the processes at present adopted scarcely yield of pyrogallic acid 25 per 100 in weight of the gallic acid employed; which, therefore, is widely different from that indicated by theory.

M. Dumas has often insisted, in his lectures, upon the necessity that exists for weighing the bodies operated upon, and afterwards weighing the products of decomposition, in order to render account of the discrepancies that may exist between theory and experiment.

That gallic acid is decomposed into gallic acid and into pyrogallic acid cannot be doubted ; consequently its present mode of preparation must be defective. This preparation has, however, received the attention of several eminent chemists. In 1843 M. Stenhouse pointed out the method now generally adopted in subliming the acid in cones of card paper. In 1847 Professor Liebig obtained a return of 31 to 32 per 100 by mixing the gallic acid with twice its weight of pumice-stone, and introducing the whole into a retort heated by an oil-bath, and effecting the sublimation in a current of carbonic acid gas.

If practice leads to results so widely different from those indicated by theory, it is because such substances as pyrogallic acid, orceine, and all analogous compounds, although volatile without decomposition at certain temperatures, decompose at these very temperatures when exposed to them too long. What renders the distillation of these substances impossible under the ordinary pressure is therefore time, and consequently bulk ; and the destruction of the matter is even more complete, when its distillation must be preceded by a chemical decomposition, such as takes place during the preparation of pyroligneous acid.

Guided by these considerations, we have first to completely decompose gallic acid into carbonic acid and pyrogallic acid, by submitting it to the action of bases and water in close vessels, as one of us had done in the preparation of orceine ; the reaction readily takes place, but the manipulations necessary to eliminate the bases are very complicated. We have only proved that at the temperature of 392° pyrogallic acid remains combined with lime, and that the carbonic acid is almost entirely driven off. We then had recourse to pure water, and the results obtained have exceeded our expectations.

We introduced into a bronze boiler some gallic acid mixed with twice or thrice its weight of water. The temperature was then raised from 390° to 410° F., and kept there for about half an hour, and then allowed to cool. The operation lasts from an hour and a half to two hours. Then we open the boiler, which contains the almost colourless pyrogallic acid, and boil it with some animal charcoal, filter it, and evaporate it at an open fire to drive off the water. Upon cooling, the pyrogallic acid crystallizes under the form of a hard mass, slightly amber-coloured, and sometimes rose-coloured. To obtain it quite white, it is only necessary to distil it in vacuo. The yield is equal to the theoretical quantity, sometimes a little more, on account of a small quantity of water being retained by the pyrogallic acid.

The boiler we employ has the form of a Papin's digester, and we employed rings of cardboard to maintain the adherence of the cover of the boiler. In our first experiments we were astonished at not finding carbonic acid, which passed through the joints, while the steam from the water is retained. We have also proved the disengagement of carbonic acid by enclosing in the boiler some glass tubes full of lime-water and baryta, were converted into carbonates.

The distillation of pyrogallic acid in a vacuum of two to three centimètres, is made with great rapidity, and almost instantaneously. M. Dumas had often called the attention of chemists to the advantage, and even the necessity, of distilling organic substances at low temperatures by operating in vacuo. M. Deleuil's new pneumatic machine, it appears to us, may be usefully applied under these circumstances.—*Compte Rendus de la Académie Française.*

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REMARKS ON THE NEGATIVE BATH.

BY M. CAREY LEA.*

It would almost seem as if everything that could be said on this subject must have been already said. Nevertheless, the nitrate bath is the central point of the photographer's operations, and that respecting which he must always feel most anxious. A photographer need not to know how to make collodion, or how to prepare a varnish, but every one has to manage his own nitrate bath, no matter how little he may have mastered the other chemical parts of photography. And I now wish to call attention especially to one extended and prevailing fallacy in the treatment recommended for a bath that will not do its duty.

The counsel generally given is to evaporate the bath to one third, then filter, if necessary, and dilute it again. Some advise a milder treatment of sunning the bath (first rendering it alkaline), and only resorting to the evaporation in case the first expedient does not succeed.

Now, the advice of evaporating to one-third seems to be based on this, that the bath in use comes to contain a certain quantity of alcohol, common ether, and other organic bodies, the nature of which is less understood—very likely bromide of ethyl, iodide of ethyl, nitrite and nitrate of ethyl, and probably yet others.

All of the six bodies just enumerated are more volatile than water. Therefore, it is presumed that when two-thirds of the water are evaporated, these bodies will be completely volatilized also by reason of their lower boiling points. This conclusion seems almost incontestible, and nevertheless is certainly wrong, as I shall presently make evident.

Berthelot has lately shown a most unexpected fact : that when in any mixture there are present two liquids of different volatilities, and the less volatile is present in a preponderating quantity, it by no means necessarily and invariably follows that the least volatile will be first driven off by the application of heat. Thus, for example, he shows that when water is mixed with alcohol in the proportion of 8 per cent., or about eleven parts water to one part alcohol, the alcohol can no longer be expelled by heat faster than the water. You may apply heat as long as you please, and evaporate till no liquid is left, but even the very last portions will contain this 8 per cent. of alcohol. Consequently, a bath which has had over 8 per cent. of alcohol introduced into it, will still contain 8 per cent. after it has been evaporated to one-third.

But this is by no means all. Alcohol is not, in this respect, an exception to a general rule, and, in some instances, the case is still stronger. Paradoxical as it may seem, when two bodies of unequal volatility are heated together, it is sometimes *the least volatile that evaporates first.* Thus Berthelot mixed a quantity of the very volatile sulphide of carbon with a small quantity of common alcohol, which is much less volatile, and distilled the mixture ; the alcohol, the least volatile body, was evaporated along with the sulphide of carbon to such an extent that, at the close of the operation, *pure sulphide of carbon*, unmixed with alcohol, remained in the retort. The least volatile body had gone over first ; and similarly I have shown (*Silliman's Journal of Science*, May, 1864), that when ethylamin, diethylamine, and triethylamine, are distilled together, the last mentioned substance, which is much the least volatile, passes over with the first products of distillation, at least when it is present in the mixture in small proportionate quantity.

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* From *Humphrey's Journal.*

The above examples are sufficient to prove how totally erroneous is the prevailing idea that when a negative bath is evaporated down to one third, all the volatile organic bodies, especially alcohol and ether, are got rid of. That their quantity is diminished is certain. If this effect were not produced, no improvement in the bath would be obtained, and experience shows that the result does follow. The bath is better, but it will not do to suppose, as many do, that it no longer contains anything but saline substances, and the water that holds them in solution. On the contrary, the probability is that every organic body which existed in the original impure bath is present still, though (of course as respects those that are volatile) in diminished quantity.

The remedy is perfectly plain:—The bath, when out of order, should be evaporated to complete dryness. Then we are as nearly rid of everything as we can be without fusion. This imposes no trouble worth mentioning—it is only to leave the nitrate solution a few hours longer on the sand bath. Excess of heat does no harm, but rather good. It will be found too, that when a bath is evaporated thoroughly to dryness, a whitish pulverulent substance is apt to be left, which does not re-dissolve when the original quantity of water is added to the dry mass again. And that the removal of this substance takes away, at least for a time, with it any existing disposition to that nuisance, pin-holes in the negative. In fact, a bath evaporated to thorough, hard dryness, is nearly as good as a new bath, which result is not even claimed by the advocates of partial evaporation, or of sunning.

A striking proof of the tenacity with which even volatile substances resist evaporation, lies in the fact that evaporation to dryness will not render a bath neutral. A new bath generally requires acidifying with nitric acid to the extent of a drop to twenty ounces of bath—some use twice or thrice as much. Even the first mentioned quantity is not driven off, or sensibly diminished. I recently evaporated a large bath to dryness, in an open glass vessel, which, after the saline mass appeared perfectly dry, was still left for two or three days upon the warm sand. This mass, when re-dissolved, gave perfectly clean pictures without further acidifying. Small as had been the proportion of acid, (1-100 of 1 per cent.) it was still present in sufficient quantity. And it is a familiar fact that nitrate of silver cannot be rendered neutral by evaporation. This end can only be attained by either repeated crystallization, or by fusion. The best results are supposed to be attained by first fusing, and then re-crystallizing; but if the nitrate has been kept in fusion for some time, every trace of free nitric acid is dissipated.

I conclude, then, that there can be no doubt that evaporation, to be thoroughly effectual, must be carried to complete dryness. I can only explain the contrary practice, as the fact that many photographers are in the habit of setting disordered and foul baths upon the stove to evaporate, and that, when this is done, evaporation, to complete dryness, is very apt to crack the vessel. I have already argued strongly against this practice as likely to be very detrimental to the health of all who are exposed to the atmosphere which results. Every photographer should have a suitable place under a hood, or in some way connected with a flue, in which he can place a sand bath to be heated, either by a gas flame, or by the hot air of his stove—say by arranging a small flat drum connecting with the smoke pipe of his stove. The first plan has the advantage, it being applicable at all seasons of the year.

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SELLE'S NEW INTENSIFIER.*

From experiments that we have made with this intensifier we are disposed to believe that it will be one of the best yet published; it is easily prepared, acts energetically, and produces a brownish-red negative that yields excellent prints. The intensification can be carried on a little deeper than is finally necessary; because the shadows become more transparent by varnishing.

No. 1.—Ferridcyanide of potassium ...	10 grains.
Water	1 ounce.
No. 2.—Sulphate of uranium	10 grains.
Water	1 ounce.

Mix equal portions of these for present use. The mixture can be used several times before it is powerless as an intensifier. The negative must be thoroughly washed from the iron developer before the intensifier is applied, otherwise the latter will form blue stains where it comes in contact with the iron solution.

Both the salts, that enter the above formula, are to the photographer new; and he will probably have some difficulty in obtaining them elsewhere than in the City or from the analytical chemist. The former salt is known also by the name of red prussiate of potash, from its relation to yellow prussiate of potash, technically called ferrocyanide of potassium.

We have not tried the experiment, but it seems probable that albumen prints toned in this solution will be turned of a brownish-red colour, which is perhaps more fanciful than artistic; it is well, however, to know the fact, because it may lead to further more important applications.

A negative was developed with the glyco-protosulphate of iron, fixed, and washed; it was afterwards flowed with the ordinary intensifier of aceto-pyrogallic acid and silver, and washed; and finally flowed with Selle's intensifier. The tone was a rich purple, and the shades were very dense.

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Proceedings of Societies.

SOUTH LONDON PHOTOGRAPHIC ASSOCIATION

The first meeting of the winter session of this society was held in the City of London College on the evening of Thursday, October 12th, Mr. A. H. Wall in the chair.

The minutes of a former meeting having been read and confirmed, a variety of matters of interest were laid on the table, and a long, but desultory, conversation thereon ensued; as no paper was before the meeting.

Mr. J. F. Taylor exhibited a bottle of Eschwege's patent naptha. He explained that it was ordinary wood naptha, which had been submitted to a purifying process, being mixed with water, filtered through charcoal, and then re-distilled. He had found it a perfect solvent for pyroxyline; and had also found that the collodion prepared with it answered well, both for negatives and transparencies, and did not injure the bath. He exhibited excellent negatives and transparencies taken with such a collodion, and, having added some soluble cotton to example of the spirit he exhibited, he afterwards showed the kind of film it gave. He regretted to add that the Inland Revenue authorities, having ascertained that it was used for the manufacture of perfumery and some other purposes, instead of pure vinous alcohol, had made it subject to duty.

Mr. Howard said he believed the law was now stringent, permitting no one to use a still without permission and supervision.

Mr. Blanchard had had some experience in preparing collodion with Eschwege's naptha, but it differed from that of Mr. Taylor. He had been indeed requested, by the Inland Revenue authorities, to test its value in preparing collodion, to make report thereon. He had found pyroxyline partially soluble in the sample supplied to him, but the film it gave consisted of a kind of net work, and it was a long time in setting. He tested its working qualities with other collodions, and found it less sensitive. On being mixed with a little ether, the cotton was more soluble in the mixture. This sample, exhibited by Mr. Taylor, appeared a better solvent than that which he had tried.

Mr. G. Wharton Simpson said he had some time ago given some attention to the use of wood naptha as a solvent for pyroxyline. He had, in all cases, found it as perfect a solvent as ether and alcohol, and more so than either alone. But, unfortunately, the collodion produced by the naptha alone was comparatively valueless, having an opaque powdery film without any coherence. This was the experience of Mr. Spiller, who, many years ago, published the fact that pyroxyline was perfectly soluble in this spirit. About twelve months ago he (Mr. Simpson) instituted a fresh series of experiments with a very pure sample of wood naptha, and found that the film given by the collodion was powdery and opaque. He then methylated spirit to the naptha, using the latter simply in the place of ether. This, he found, gave an excellent film, and answered well every way. This, he thought, was important, inasmuch as it produced a very much cheaper collodion than that made entirely of Eschwege's naptha, even if the latter were sold without duty.

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* From *Humphrey's Journal.*

Mr. **Taylor** said that Eschwege prepared two qualities, of which this was the best; the other sample contained more water.

Mr. **Taylor** said that his chief object had been to furnish occasion for a discussion on the use of methylated spirits in collodion.

Mr. **Foxlee** asked if this sample of naptha would be more suitable for collodion than the unpurified sample.

Mr. **Simpson** said it was impossible to say without trial; but the use of the term purified was apt to mislead in such matters. In removing the unpleasant smell and taste it did not follow that something which, photographically speaking, was impure or injurious was removed. So far as we knew at present, naptha which had not been so treated might answer as well for photographers' purposes as that which had undergone Mr. Eschwege's process. After many careful experiments and years of experience he believed that methylated spirits were in no wise injurious in collodion.

Mr. **Blanchard** said he had been assured that very impure spirit was often used in making methylated spirit, which might be injurious.

Mr. **Simpson** said if injury arose from such a cause it would be due to the impurity of the vinous spirit, and not to the presence of methyle.

Mr. **Hart** asked if any one had found naptha injurious to the eyes. In making a sealing-wax varnish with it, his eyes had suffered.

Mr. **How** said he had made such varnish largely, and never heard the men complain.

Mr. **Taylor** mentioned a case of French polishers striking work on account of its use. He had used methylated collodion extensively, and believed that it was as good as that made from pure vinous spirit.

After some further conversation the subject dropped.

Mr. **Noel E. Fitch** showed a charming vignette head on opal glass by the collodio-chloride of silver process, which was much admired.

Mr. **Simpson** exhibited a gelatine mound, a metal plate, and several very fine prints on paper and glass, illustrating Mr. Woodbury's method of printing in relief.

The **Chairman** called especial attention to the great promise of this process, and its incalculable importance. Other members expressed a high opinion of the results.

Mr. **J. C. Leake** presented to the society a very excellent vignetted 10 by 8 print, containing shipping and very fine clouds, taken with an exposure of about two seconds.

Mr. **Howard** exhibited a large number of very fine prints 7 by 4½ inches, taken during a summer ramble in Devonshire. He especially exhibited them to illustrate the excellent working of Dallmeyer's new wide angle landscape lens. The better to effect this object he exhibited a print of the Harbour of Ilfracombe, taken with a Ross view lens of 10 inches focus, and another of the same subject taken, without moving the camera, with Dallmeyer's new lens of 7½ inches focus. Both were taken with the largest stop, and both were exposed the same time; both the pictures were of the same size, and both about equal in definition and exposure. The new lens, however, included a very much wider range of subject, and was consequently by far the finest picture.

All the pictures were very fine, and were much admired. The majority had been taken by the wet process, and there were some exceedingly perfect prints from dry-plate negatives.

The **Chairman** called attention to the value and importance of the power of including a wide angle. Much of the perfection which these pictures exhibited was due to the wide angle they embraced; cutting away a portion of the subject would, in many cases, spoil the picture.

The **Chairman** called attention to some reproductions of Pugin's architectural designs, &c., by Mr. Ayling.

The **Chairman** called attention to some examples of enlargements coloured in oil by himself, and referred to the boon which photography had conferred on society in affording facilities for life-size portraits, to take the place of the vulgar family portrait of former days. He also called attention to a very good enlargement by Mr. Andrews, of Swansea. He referred to a subdued light as frequently giving the best of negatives for solar camera enlargements.

After votes of thanks to the various gentlemen who had exhibited specimens, &c., the proceedings terminated.

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, October 18th, 1865.

Mr. **Blondeau** has presented to the *Académie des Sciences* an essay on gun-cotton, which is a complete summary of the history of that substance, and of our present state of knowledge respecting it. The essay possesses much interest, but its great length precludes the possibility of transferring it to your columns *in extenso*. I will therefore limit myself to a condensed summary of the ten chapters of which the essay consists.

1st. Pyroxyline is a definite combination of a substance isomeric with cellulose, designated by the name of *fulminose* and *nitric acid*. Pyroxyline explodes at the temperature of 284° Fah., because at this temperature fulminose is decomposed into aqueous vapour and carbon. This latter is converted into oxide of carbon by the oxygen of the nitric acid, and the products of the explosion are, oxide of carbon, nitrogen, and aqueous vapour.

The formula which represents the constitution of pyroxyline is—

$$C^{24}H^{20}\,O^{20}\,(NO^{5})^{5}$$

2nd. Pyroxyline is a pentabasic anhydrous acid, which should be named *pyroxylic acid*. It is susceptible of combining with five equivalents of water, and then, under the name of *collodion*, a hydrated acid, which combines with bases, and forms *pyroxylates*.

3rd. Fulminose takes five equivalents of nitric acid, only under the influence of sulphuric acid. When we employ nitric acid only in its preparation, we obtain a compound much less detonating, which contains only four equivalents of nitric acid, and which we have designated by the name of *nitric cotton*. This cotton is also susceptible of becoming hydrated, and then produces what is called *xyloïdine*, which is to nitric cotton what collodion is to pyroxyline.

4th. Pyroxyline is susceptible of combining with ammonia, giving rise to a compound which may be considered as an amide, which we have designated by the name of *pantamide cellulo-nitric*. This amide combines with acids and forms compounds having some relation with salts.

5th. Pyroxyline is decomposed when it is kept for some time at a temperature of 212° Fah., first disengaging nitric acid, then giving rise to various products, resulting from the action of this acid upon the elements of pyroxyline; that is to say, of nitric cotton from the xyloïdine, oxalhydric acid, and from the products of the decomposition of the latter, that is, from the carbon. Sometimes, under the influence of heat, ammonia is formed, which, uniting with the non-decomposed pyroxyline, constitutes a compound which is nothing else than *pantamide* cellulo nitric.

6th. Pyroxyline is decomposed at the ordinary temperature, giving rise to products which are successively formed when the cotton is put in contact with nitric acid, and which products have already been maintained. Heat only accelerates this action.

7th. Pyroxyline may be rendered fixed and indecomposable at ordinary temperatures, either by combining with it a certain quantity of ammonia, or in uniting hydrochlorate of ammonia with it, so as to form the compound we have designated under the name of *hydrochloride of pentamide cellulo-nitric.*

The principal defect in the nature of gun-cotton is its tendency to decompose spontaneously; and this defect is so grave, that if we could not succeed in removing it, we should be obliged to abandon the idea of turning to account a substance which may give rise to the most serious accidents.

Pyroxyline combined with ammonia acquires the much desired stability. It then forms a succession of compounds as described above. If the action of the ammonia be stopped when the first of these compounds is formed, we obtain a pyroxyline which, while preserving its explosive power, at the same time acquires a fixity which not only renders it unalterable at ordinary temperatures, but which even prevents it exploding at 212° Fah.

To prepare this new pyroxyline, gun-cotton of good quality is exposed to the action of ammonaical vapours for about four hours. The pyroxyline even acquires a yellow tint, the index of its combination with ammonia, and furnishes, after being dried, a fixed powder possessing a greater explosive force than that of ordinary pyroxyline.

M. de Monfort employs a solution for developing and intensifying negatives which he thinks photographers will be sure to adopt after making trial of it.

The solution consists of a mixture of the sulphates of iron and copper, which he does not offer as anything new, but he makes the mixture in a manner and in proportions entirely different from those previously recommended.

He first dissolves 5 grammes of sulphate of copper in 100 grammes of water. When the solution is complete, he adds to it 200 grammes of a saturated solution of protosulphate of iron. Afterwards 5 grammes of nitric acid are added; then 1500 cubic centimetres of common water are added, and the mixture is filtered. (For *grammes* take grains; and for *cubic centimetres* take minims.

This developer causes the picture to appear very rapidly, without its being necessary to throw the whole at once upon the plate to avoid spots and streaks, which occur with the sulphate when employed alone. But the real advantage of it consists in the intensifying being effected with the same liquid, without taking a fresh quantity. It is sufficient to pour into the developing glass five or six drops of solution of nitrate of silver of 3 per 100, without even previously washing the plate. The intensifying takes place immediately without fogging or other accident, much more rapidly than with the pyrogallic acid employed by most photographers after the iron development. Besides, if the exposure has been well timed, there will be no occasion to intensify, for the image will appear very vigorous and transparent. This process will evidently give a notable economy of time and materials. The collodion M. de Monfort uses contains only iodide of ammonium and bromide of cadmium.

M. Lorain has arrived at a method of producing formic acid on a large scale. It has been for a long time known that the reaction of oxalic acid and glycerine gives rise to a small quantity of formic acid, greatly diluted with water. The eminent chemist, Dr. Hoffman, had expressed his regret that this process could not be transferred from the laboratory to the manufactory, and this is the problem that M. Lorain has solved. By substituting dehydrated oxalic acid for ordinary oxalic acid, he has succeeded in obtaining 56 per 100 of formic acid with equivalent of water; and also by adding the suitable alcohol in preparing the various formic ethers.

THE DANGERS OF CYANIDE OF POTASSIUM.

Sir,—Permit me, as a constant reader of the News, to ask your opinion on the following statement. During the last seven or eight years I have done a great deal of work in photography, though only for amusement, and have been in the habit, at the end of each bout of working, of cleaning my fingers by dipping them in a bottle of strong solution of cyanide of potassium, then rubbing them with pumice-stone, and forthwith washing thoroughly with water and soap.

No harm seemed to result from this till within, perhaps, the last eight months. But since last winter I have found myself losing nearly all the muscular power in my arms and hands, and my fingers are very often so weak as to be incapable of performing the most simple actions, such, for instance, as holding a tooth-brush, fastening the buttons of a shirt, and so forth. Shaving has become almost impossible, for, in addition to the fingers being unable to grasp the razor firmly, there is an unceasing quivering (and, as one may say, "jerky") action going on in both arms, over which I have no control whatever.

There is not, in any respect, the least appearance of paralysis, or absolute deprivation of the power of movement, and my general health seems as good as ever—better, probably, than is enjoyed by most persons—but I am often temporarily unable to straighten or properly extend my fingers, and especially the thumbs, and after writing a line or two, a sort of (painless) cramp attacks and cripples the back of my hand and lower part of my arm, and compels me to wait a minute or so. The case is altogether most annoying and very difficult to understand, but it occurs to me that it may have arisen from the use of the cyanide of potassium, and I should feel very thankful for your opinion on the subject. If my suspicion appears to you well founded, the case may be useful as a warning to others.—I am, sir, yours faithfully, E. K.

30th September, 1865.

[The chief local action of cyanide of potassium consists in the production of ulcerous sores. It may, however, under some circumstances be sufficiently absorbed through the skin to produce the symptoms of poisoning, such as convulsions, tetanus, loss of muscular power, &c. Its action is moreover considerably governed by constitutional tendency. The symptoms described by our correspondent are those of incipient paralysis of the limbs affected. If these symptoms arise from a constitutional cause, they will probably affect the lower limbs as well as the hands and arms; if they are confined to the latter, it is probable they may arise from a local cause. It will be well to consult a medical man, and, in any case, give up without hesitation the use of cyanide of potassium. Its use is unnecessary, and always dangerous. We know an eminent photographer who has been suffering severe ill health for some months past, clearly traceable to inhaling the fumes of cyanide in a confined operating chamber.—Ed.]

PHOTOGRAPHY IN GERMANY.

Sir,—The most important novelty which I have to communicate to you is the discovery of a new wide angle lens for landscapes, architecture, and reproduction. The same was theoretically discovered by the celebrated optician and professor of physics, Prof. Steinheil, of Munich, and then practically carried out in his workshop. The new objective is distinguished from others in this, that it includes an angle of 90°, perfectly sharp, without any distortion, and takes in a luminous circle of 110°. Mr. Albert, of Munich, with one of these objectives of 2 inches, has produced photographs 30 inches long, which excite the admiration of all scientific men. That which is most remarkable in this objective is its simplicity, it consisting merely of two components, and hence the picture is perfectly achromatic. The actinic power of the same is not less than that of the globe objective of Harrison, while the price is very much less, and the construction simpler. For the present I can only tell you this from Prof. Steinheil himself. The great reputation of this scientific man is voucher for the truth of his statements. In a few days I am to receive such an objective, (Stenheil calls them Periscope), and I will communicate to you the results of my experiments.

Since I am speaking of optics, I may mention the new process of my friend Professor Toepler, in Riga, for discoveries of imperfections in optical glasses. The process is founded on continually occurring variations of the refracting index. A short letter does not allow me to enter upon the complicated theory. I will therefore describe the process in a separate article. How exact the same is may be seen from the fact that Prof. Toepler has discovered by this process imperfections in the best telescopes of the Observatory at Dorpat. He has indeed made vibrations of the atmosphere visible.

To my great astonishment I see that Obernetter's Enamel Process has been made public in England. I have known this for a long time, but have been pledged to secrecy.

The statements in the News do not entirely agree with those of Obernetter himself.* Those who have been successful in this department besides Obernetter are chiefly Leth, of Vienna, and Grüne, of Berlin. I herewith give you

Leth's Process of Enamelling.

Gum arabic	20 grains
Water	10 drachms
Saturated solution of bichromate of potassium	2 drachms
Solution of honey (1 honey, 1 water)	½ drachm

are mixed together and filtered, and then poured upon warmed china of some kind, and afterwards the same is dried by a moderate heat. (A too strong heat renders the surface insensible to light.) When dry, the plate is exposed under a transparent positive removed from the glass; 30 to 90 seconds in the sun, and 3 minutes to 15 in the shade. Too long exposure is less injurious than too short. After the exposure, the surface is covered with enamel colour, to which a suitable flux is added, and after a short time the surplus of the same is removed with a soft brush. Then the object is placed in a solution of 1 ounce nitric acid and 16 ounces of water. The water dissolves those parts not acted on by light. Afterwards the picture is carefully washed till all the acid is removed, and then dried, and then carried into the muffle. One may also make the picture upon a glass plate, and after development cover with collodion. The picture is then laid in water mixed with nitric acid, and washed till the chromic acid is removed (finally with pure water). The collodion becomes disarranged by this process, and is then, under water, applied to the porcelain. It accommodates itself very readily to the form of the object. After the drying the collodion film is removed by alcohol and ether, and then the picture is burned.

Leth's enamel colour is prepared in the following manner:—

Sulphate of cobalt	1 part
Sulphate of zinc	½ ,,
Sulphate of iron	1 ,,
Sulphate of manganese	1 ,,
Saltpetre (nitrate of potassium) ...	6 parts

These are heated in a pot till the saltpetre is entirely decomposed, and after being cooled, washed and dried. The flux consists of

Red oxide of lead $Pb^3 O^4$	6 parts
Sand...	2 ,,
Borax	1 part

These are melted together, and the mass then finely powdered. For practical use, 1 part of the colour is mixed with 2 to 3 parts of flux. As you see, this process is similar to that of Joubert and Obernetter. Entirely different from this is that of Grüne. This is decidedly the simplest of all, if it does not furnish so perfect results as that of Obernetter, and can be used by every practical photographer. Grüne generally makes one ordinary transparent collodion positive, dips the same in a solution of salts of different kinds of metals, and obtains thus a precipitate of metallic oxides, which latter burn in black. The positive is then washed, and, similarly to the process of Leth's, put upon porcelain. The further details have not yet been made public.

Dr. Hermann Vogel.

Berlin, October 5th, 1865.

THE GELATINO-IRON DEVELOPER.

Sir,—May I be allowed to suggest to Mr. Cooper, jun., through the medium of your columns, one or two things calculated, I think, to improve *his* formula for the organic iron developer.

1st.—Boiling the solution of glycocine might be omitted with advantage, for the three following reasons:—

a.—If the excess of ammonia be as small as it ought to be, there will be no necessity for this proceeding (boiling) to remove it.

b.—If the solutions are made cold from the beginning, phosphate of lime remains behind at the bottom of the vessel in which the glycocine is made, which is dissolved if the acids are used hot, or made hot afterwards. For this reason, I gave up working, as in my first communication, and keep the solutions cold, as in the second.

c.—If necessary, in Mr. Cooper's opinion, to make the solution boil, it would have been more simple to dissolve the gelatine in *hot* water; and then the addition of sulphuric acid would make it boil violently. In this way of working, which I have tried several times, the solution of glycocine may be used directly, the whole of the phospate of lime being dissolved; however, I do not like this so well as the other way of working.

2nd.—If, in Mr. Cooper's opinion, it is any improvement to add the gelatine dissolved in acetic acid to this developer, it would have seemed simpler to work in the way recommended by Mr. Carey Lea, and to use three drachms of gelatine with the right proportion of sulphuric acid from the first.

I may here, perhaps, remind Mr. Cooper that in his first solution (No. 1) he has not converted *all* the gelatine into glycocine, though it may be all dissolved. The strongest commercial sulphuric acid is of a sp. gr. of about 1·846, which contains, roughly, 80 parts of pure acid in 100 of water. The combining equivalent of sulphuric acid being 49, and that of gelatine 154, it will be seen that about 11 drachms of acid of the above strength would be required to turn the whole of the above gelatine into glycocine. Now, seeing that gelatine is equal to eight times its quantity of acetic acid (glacial) as a restraining agent, I think that a little calculation will show that Mr. Cooper has at least used a very large proportion of restraining agency in his developer; so much so, that I think it might be reduced with advantage. It will be seen by reference to the formula on page 466, that a much smaller quantity of acid (or its equivalent) is used than given by Mr. Cooper, and I am prepared to show (and hope to show in next week's News), that the formula there given may be modified by the addition of a large proportion of a substance which is calculated to reduce the effect of the restraining agency to a very considerable extent.

I may add that if Mr. Cooper keeps solutions Nos. 1 and 2 separate, he will find No. 1 "go bad" in the course of a few days if kept in a neutral condition.

Hoping that the gentleman whose name I have been obliged to introduce into this letter will kindly excuse the liberty I have taken with his formula, in thus making a few suggestions of improvement, I beg to remain yours, very faithfully,

Nelson F. Cherrill.

Belmont Lodge, Lee, S.E.

P.S.—As the true test of the addition of the right amount of acid to Mr. Cooper's developer, can he obtain by its use the same amount of detail in the *deep shadow* as when using the old form of solution, using the *same* exposure in each case?

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* Our statements were derived from the specification of his English patent, now in the Patent Office.—Ed.

THE NEW SYSTEM OF RELIEF PRINTING.

Sir,—If Mr. Woodbury had disliked personal discussion as much as I do, he would have left my letter unanswered, in which case there would have been no occasion for a rejoinder. He has no ground for saying that your article affords "just the opportunity I wanted, and have doubtless been waiting for," &c. Nothing can be more untrue, the fact being that I never wrote anything which gave me so much pain as that letter, and I would most gladly have escaped the necessity of renewing the subject. But as I explained, the alternative of silence involved consequences too adverse to the public interest and my own to permit of your remarks being passed over. It is now a further source of regret that his last letter compels me to ask your permission to reply to his "one or two statements."

Mr. Woodbury says in his letter to you in the last News:—"Had I not, in the early stage of my invention, shown you examples of my process, you would very probably have had to keep Mr. Swan's secret for an indefinite period."

This is incorrect. In any case, I should have published the process very soon after the date at which your article appeared. It was according to your advice that I published at that particular moment. The publication of the process was precipitated, and, as I now think, unnecessarily precipitated, by your communication to me concerning Mr. Woodbury; but at all events, I should at a very early date have given publicity to the invention. There is therefore no ground for apprehension of the long delay which Mr. Woodbury supposes. He seems to have found it in the fact that photographic engraving had engaged my attention, more or less, for twenty years, and he concludes that when I had made a discovery on the subject, I must therefore keep it unpublished for twenty years longer. Logic like this is unanswerable.

Mr. Woodbury's next inaccuracy is the statement, that if you had not published the new idea on *my* account, you must have done so on *his*. He says: "Whether Mr. Swan had withdrawn his secrecy or no, you would doubtless have published my communicated ideas on the subject." I believe I am right in saying that Mr. Woodbury made no communication to you such as would have necessitated the publication of an article on "a new system of printing." When he exhibited to you various objects in connection with his patent, he, at the same time, showed what you describe as "a rough print in coloured gelatine." But you say that "he did not regard the principle (on which it was produced) as capable of very successful application."

Now, right or wrong, the impression which he left on your mind was that "he did not regard the principle as capable of very successful application." (1) How then could your exposition of "a new system of printing" have resulted from an impression like this? So far as the new system of printing is concerned, the only idea which Mr. Woodbury communicated to you, appears to have been exactly such as would have deterred you from saying anything about it. In writing of his patent, (2) you would naturally have spoken of the objects to which it more particularly refers, and to which he attached importance, these being, the copper moulds, the transparencies in porcelain or imitation of it, and the plaster casts. These objects have no necessary connection with the new system of printing, and they might have been written about without the idea of the new printing process being touched upon. Porcelain transparencies and plaster casts are not like the gelatine print, new in their kind. Similar objects have been long known, and their production could not be styled a new process of printing, or a printing process at all. The novelty of Mr. Woodbury's invention clearly consists, according to his patent, in a new method of producing copper moulds, out of which articles, not essentially new in their kind, were to be made, and made not by a new process, but by the ordinary methods employed for the production of similar articles. I think that, apart from my communication to you, this is the view which, in writing of Mr. Woodbury's invention, you would have taken; possibly, not speaking of the "rough print" at all, or, if speaking of it, it would certainly not have been made the theme of an article on a new system of printing. (3) It seems all but certain that you would have looked upon the gelatine impression which he showed you with the same indifference with which he regarded it, if my scheme of the new printing process had not previously been impressed on your mind, and my better results known to you. For it is not reasonable to suppose that you would have written at Mr. Woodbury's instance such an article, when he himself seemed to regard the process as impracticable. There can, I think, be little doubt of this, that although Mr. Woodbury had produced impressions more or less like mine, yet he did not see in them what I saw and led you to see—the germs of a new and valuable process.

I think it is not unlikely, that if my ideas had not been published, Mr. Woodbury would have continued to regard his gelatine impressions with the same indifference as at first, and would, in all probability, not have prosecuted the idea. It is also remarkable that Mr. Woodbury's patent-agent, although having seen a similar print, was led to attach so little importance to it as not to mention it or anything relating to it in the provisional specification. This fact, I think, most distinctly contradicts the impression which Mr. Woodbury wishes to make, viz., that the patent was taken out with a special view to such prints.

Mr. Woodbury thinks I am anxious "to pick his provisional specification to pieces." He is mistaken. I merely wish to show its real nature, in order that I may establish my right to the priority of invention and publication of the new process, and that the public may see that there is no ground for the pretension that it is included in Mr. Woodbury's patent. (4) This is the more necessary, as there is a most persistent effort to hoodwink the public in regard to this patent, and a wonderful amount of ingenuity is exhibited in the attempt to make Mr. Woodbury's specification appear to mean what it obviously does not mean.

For example, Mr. Woodbury says that "the novelty of his process consists in [the use of] other semi-transparent material." Then, as the novelty of the process consists in the use of this "other semi-transparent material," why not have mentioned its name? It is surely an unheard-of thing to omit to mention in a provisional specification the name of the thing in the use of which the novelty of the patent consists! And yet this is, according to Mr. Woodbury's own showing, what has been done.

As to the ridiculous idea of the prints being transparencies, Mr. Woodbury says, "I maintain that the wording, 'viewed as a transparency,' is the most suitable term to use in describing them." That is to say, the most suitable term to use in describing them is a term which does *not* describe them, for they are certainly not viewed as a transparency, but as ordinary prints are viewed. Because the colouring matter or vehicle used in making the print happens to be more or less transparent, does it follow that the picture produced is a transparency, and to be viewed as a transparency? It is just as rational to speak of indian-ink drawing and mezzotint or aquatint engraving as transparencies, as to speak of those prints as such.

The fact is, that the definition—"So that when viewed as a transparency, the varying thicknesses of the material will show the picture or design," was not originally intended to apply to the new prints; it was only meant to describe, and only does describe correctly, porcelain transparencies, and things strictly of that kind. It was an afterthought to make the patent apply to anything else. Hence arises the necessity to show that things essentially and broadly different are one and the same, and, in my opinion, a lame attempt it is.

In comparing Mr. Woodbury's provisional specification with his complete specification there appears a deliberate attempt at metamorphosis—a shunting off one line of invention on to another. And I marvel at the effrontery with which the illusion is sought to be upheld.

It would be infinitely to Mr. Woodbury's credit to abandon this disingenuous procedure, and to rest his claims in connection with this process on what I am as ready as anyone to give him credit for—a very energetic prosecution of the new process.

I hope, sir, that this is the last of an unpleasant correspondence, and I remain, very truly yours,

Newcastle, October 17th, 1865. Joseph W. Swan.

[As we said before, it is no part of our duty to discuss this question except so far as remarks of our own form the basis of part of the argument, and in relation to these remarks it necessarily rests with us to define their exact intention and value. We have, therefore, numbered certain sentences in the above letter for brief notes. (1) Our impression was, as we stated it, that Mr. Woodbury did not attach much practical value to the process; but he showed us a print as an illustration of a curious method of obtaining a picture possessing gradation in tint. The exact extent of his ideas on the subject we did not learn, inasmuch as, possessing Mr. Swan's secret, we felt it dangerous and dishonourable to converse on the subject; dangerous to Mr. Swan's secret because of the difficulty of talking on a subject without saying or suggesting something more than is intended; dishonourable to Mr. Woodbury to draw him out on a subject to ascertain the limit of his knowledge, without saying anything of interest in reply. We therefore changed the subject after a brief conversation. Our impression of the importance he attached to the discovery may be right or wrong, but it was simply an impression, and we should be sorry if through our statement of it any injustice were done to either party. (2) Mr. Swan forgets that when Mr. Woodbury brought the matter under our attention we did not see his specification, and we could not, therefore, have written about its details. We simply saw two results, a print in coloured gelatine, and a cast in plaster made semi-transparent, and we must do Mr. Woodbury the justice to state that he seemed to regard them both as applications of the same idea, the print as forming a picture by different thicknesses of coloured semi-transparent gelatine, the other as forming a picture by means of different thicknesses of semi-transparent plaster, &c. (3) We should certainly have spoken of and fully described the rough print; but how much importance we should have given to it, it is quite impossible to say. Having a certain idea on the subject, we of course viewed in the light of that knowledge. But it is too much to assume that it would not have suggested anything important to us unless we had previously received Mr. Swan's ideas on the matter. Our recent familiarity with carbon prints, which we had described as pictures formed of different thicknesses of coloured gelatine, would have prepared us for appreciating these prints. The possibility of producing them by mechanical means was a startling novelty; this Mr. Swan communicated to us, and pointed out its great possibilities. We have given him every credit for this; but he must see that Mr. Woodbury must have had the same idea in a more or less developed state, as he had prepared his coloured gelatine, filled his mould, and obtained a print on paper by pressure. This once done and described, it is quite impossible to say that the idea of its importance would not have occurred to him, to us, or to some of our many ingenious readers. (4) Mr. Swan's priority of invention has never been denied; we have repeatedly expressed our conviction of such priority; the publication of his ideas and those of Mr. Woodbury were contemporaneous, the chief credit for the elaboration of the idea being given to Mr. Swan. But Mr. Swan must see that all discussion of the patent claims is futile, since neither his opinion nor ours can make any difference in a question which must, if necessary, be settled by a legal tribunal. Even if Mr. Woodbury did not attach much importance to this part of his discovery, it would make no difference in his patent-if it were included in the specification, as he and his patent-agent state it is; and as, unless we are to believe Mr. Woodbury guilty of deliberate untruth, which we decline to do, he placed a specimen in his agent's hands to be included in his specification, it is only fair to assume it is intended to be described and included, however inadequate and imperfect, according to Mr. Swan's ideas, and, to some extent, to our own, the description may be.—Ed]

Photographic Notes and Queries.

Sulpho-cyanide for Fixing.

Sir,—I fully coincide with "Quarto," in your last week's number, that blistering of albumenized paper is caused by fixing in hyposulphite of soda, for I was much troubled with it a short time back, when I thought I would try fixing with sulpho-cyanide of ammonium, and found that it proved a certain cure. If "Quarto" will give it a trial I think he will not again complain of blisters. I use it in the way you suggested for uranium prints, viz., 2 ozs. dissolved in 8 ozs. of water. After the prints have lain in that for about fifteen or twenty minutes, I give them a rinse in a large quantity of water, and again immerse them in another weaker solution of sulpho-cyanide, about half the strength of the first, for five or ten minutes, and then rinse in several changes of water, and afterwards soak for an hour or two, changing the water four or five times. There is one thing on which I should like to have your advice, which is, I find, after fixing half a dozen prints in the first solution of sulpho-cyanide, the water in which I place them becomes milky; is that an intimation that the fixing power is exhausted, or will do still longer, for I use it over and over, and in so doing I think there is little difference in the expense between that and hypo, and at the same time with less trouble, as it does not require so much washing?—I am, sir, yours truly, J. W.

[The sulphocyanide solution is too weak to begin with, and whenever the first washing water becomes milky, imperfect fixation is indicated.—Ed.]

Stains Between the Film and Glass.

Sir,—I see by a correspondent, "Lens," in your last number, that he has got into the same dilemma as myself with stains under the film, and not visible on the collodion side. As this to me was stains of a new character I was puzzled to know how to find out a remedy. I first tested my glasses, to see if they were perfectly clean. I then tried several new developers, and made a new bath, but all to no purpose—the stains still continued. I scarcely knew how to act. It did not occur to me at first that the collodion might be at fault. I then tried another make, and, to my great astonishment, the stains disappeared. Now, to make sure in my experiments, I used both collodions alternately with the same bath and developer, which convinced me that the fault was in the collodion. I have guarded against mentioning the makers' names, as both were of high reputation. If you will kindly give me the address of your correspondent "Lens," I should like to get further particulars. I should not, however, now have troubled you with this long letter, only I thought some other photographer might be perplexed with the same cause.—Yours respectfully, James Date.

Watchell, Oct. 16, 1865.

Novel Reticulation in Films.

Sir,—I enclose two prints which exhibit what I think is identical with the peculiar reticulated markings in the prints sent by "G. U. N.," mentioned in the News of October 6th. I have been troubled with these defects more or less in *hot weather*, but only with one maker's collodion. I do not think they can be referred to the gelatine developer, as I have had the pleasure (?) of seeing them for the last three years. They make their appearance and continue for a week or two, and then disappear. I have never yet been able to ascertain the cause, but have sometimes found that thinning the collodion has partly got rid of them; this, however, is likely to produce bad working qualities in the particular collodion I used. They are always of a hexagonal or honey-comb shape, the lines being, as you observe, opaque, and giving a "stippled" appearance to the print, particularly on the background; the latter being generally more or less even in tint, would perhaps be more likely to exhibit the presence of such marks. I have used the ordinary iron developer, and have not found any defect in the quality of the negatives, it having shewn itself at all times of the day and in all conditions of light, but, as I before remarked, more frequently in hot weather. I should be glad to hear the opinion or experience of others on the subject.—I am, Sir, your obedient servant,

Bromo.

[The reticulation in the prints sent is similar to that to which we recently referred, and is the opposite in character to the reticulation well known.—Ed.]

Talk in the Studio.

Blistering in Rive Paper.—A correspondent who has been much troubled with blistering in Rive paper states that he has recently been using nitrate of soda in his printing bath, since which not a sheet has blistered. Have any other of our correspondents who use nitrate of soda noticed this?

Collodio Bromide of Silver.—Mr. Mawdsley, of Liverpool, has favoured us with a charming print from a stereoscopic negative taken by Mr. Sayce's collodio-bromide process. The print has all the characteristics of one from a wet plate, softness and transparency of shadow. Mr. Mawdsley finds the process so simple and so rapid, and the results, both in negatives and transparency, so excellent, that he has resolved to abandon the nitrate bath altogether.

Stealing Photographic Apparatus.—There have been several cases recently, we regret to state, of operators robbing their employers. At Salop, the other day, Charles Jackson was charged before the borough magistrates with stealing negatives, prints, &c., from Mr. Groom, his employer, and was committed for trial. At Worship Street, a few days ago, an assistant was remanded on a similar charge. These things are the more to be regretted as they will in many instances place respectable men in circumstances of less trust than they deserve.

Photograph of the Eclipse.—We understand that Mr. Warren De La Rue took a photograph of the lunar eclipse of the 4th instant. The atmosphere having been clear, the image is said to be excellent, and affords another proof of the important advantage now open to observers who make use of photography. When it is understood that an instantaneous image of a phenomenon can be taken, it will be seen that by no other means could the various movements to which our satellite is subject be so well observed and recorded as by photography. By associating this new image with one of a former eclipse, Mr. De La Rue obtains a stereoscopic effect singularly remarkable. To a practised eye the bulging hemisphere of the moon appears almost transparent, comparable to a huge glass shade covering a flat surface.

The Magnesium Light.—Mr. Solomon informs us that the picture copied by the aid of the magnesium light, by Mr. Thurston Thompson, was "The Meeting of Wellington and Blucher after the Battle of Waterloo."

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To Correspondents.

A. M.—The method of intensifying described by Mr. Carey Lea with Schlippe's salt, which appeared in a recent number, will give intensity without adding to deposit, and is therefore valuable for negatives of engravings in which it is important to avoid filling up the fine lines. Should this not be available, any of the methods with mercury may be employed. Treat the negative with a solution of bichloride of mercury, about 5 grains to the ounce, until it has assumed a uniform grey tint, then wash well, and apply a 1-grain solution of iodide of potassium. The result will be a negative of a greenish grey tint, which is very non-actinic. Or the action of the mercury may be continued until the negative is white, and then the deposit may be blackened by the application of a dilute solution of ammonia. A negative may be made more intense by the application of a solution of sulphide of potassium, which blackens without thickening the deposit.

W. W.—The yellow stains on your prints are the undoubted result of imperfect fixation, or of acid hyposulphite of soda. Whether the hypo you are using is bad, or whether by some mistake you are using it weak, or old, or acid, or whether the prints have been imperfectly immersed, we cannot say. It is possible that coming into contact with zinc whilst the hypo is in them might produce such a result; but prints should receive a careful washing, being attended to by hand for five or ten minutes after leaving the hypo before going into a washing machine, and in such case the bulk of the hypo would be removed before coming into contact with the zinc. The white mottled marks on the sea view look like the result of a highly salted paper and a weak nitrate bath.

N.—Select a bright clear day, and copy the picture out of doors; you will get a tolerably even light without any kind of screening; if the sky light seem too powerful, tilt the top of the picture slightly forward and place the camera at a similar inclination; by such means we generally manage to copy oil-paintings without difficulty. Sometimes it is desirable to cover the camera, brasswork of the lens, &c., with black velvet, to avoid reflections. If the picture be very dull and the detail does not bear out well, sponge its surface, and, if necessary, repeat the process a few times during exposure, of course capping the lens in the meantime. As the weather is getting cold you will have comparatively little difficulty in keeping the plate moist. Use a new bath not over-saturated with iodide of silver, allow each corner of the plate to rest on a piece of damp blotting-paper, and cover the back of the plate with wet blotting-paper. By these means you will probably keep the plate in good condition from half an hour to an hour, and need no re-dipping after exposure. If it be necessary, employ a neutral ten-grain bath for re-dipping, or, if it be acid, let it be with acetic acid. The best developer will be the new organico-iron developer, as it readily affords intensity, and permits prolonged development without danger of fog. As to the stop, much depends, of course, on the size of the original picture and of the copy; we should use the largest stop which we found on trial gave sufficient definition. In dealing with the oak-panelled room, you will probably not have much trouble if the room be moderately well lighted. If it have a polished surface avoid the presence of objects giving unpleasant reflections. There have been several communications on the splitting of the film during the last two or three months, some of which will, we hope, meet your case.

Subscriber.—You will find full information on the use of formic acid in the developer in the Photographic News for June 12th, 1863.

J. W. Jennings.—See answer to Subscriber above. It is impossible to give an "Instantaneous developer." Much depends on the kind of collodion, the kind of subject, the light, &c., in obtaining instantaneous pictures, but as a rule a strong iron developer, say 50 grains of protosulphate of iron, and 25 minums of acetic in an ounce of water will answer well.

C. B. P.—Agitate your printing bath with kaolin, and filter; or add a dessert spoonful of a 20-grain solution of salt and water, shake and filter; or boil, sun, and filter. 2. Weak negatives may be the result of a new thin collodion, or of a weak bath, or of a bad light, or of over exposure, and also of other causes. Ascertain if any of these are present in your practice, and if so, remove them. 3. Your background is a little too dark for vignette pictures; No. 1 of your pictures is over-intensified; Nos. 2 and 3 very good.

Carbon.—There is no published treatise on photolithography. The best information on the subject will be found in Mr. Osborne's articles in our sixth volume. Col. James has published an interesting work on photozincography, but it does not contain very minute technical intructions.

One who Studies the News.—We do not know of any Photographic Exhibition about to take place shortly. We question whether the Photographic Society will hold an exhibition the coming winter or not. Most photographs look better with a card mount over them. An oval picture may be exhibited with an oval frame, but it always runs a risk of being put in an out-of-the way place, because of the difficulty of hanging with square pictures. Some of the numbers of the News containing Lake Price's articles on composition are out of print; it is uncertain whether they will be reprinted. The information on subjects generally is scattered through many works. You may find valuable information in Burnett's works, Ruskin's works, Hazlitt's Lectures on Art, the academy lectures of Sir Joshua Reynolds, Opie, Howard, Fuseli, and others, Howard's "Sketcher's Companion," and his "Student's Manual." The lighting of the single figure is not bad, but the print being very imperfect and mealy spoils the effect. The group is lighted from two sides, the light from each being of nearly equal intensity, and the effect is not good for general purposes.

Ben Lomond.—We regret to say that we cannot help you. We have experimented considerably in the manufacture of varnishes, but we do not know any gum resin which, dissolved in spirit, will dry bright without heat. There are several which will dissolve in benzole, chloroform, &c., and dry without heat. An alkali acting on a resin changes its properties. We think you err in not taking our advice regarding the matter of your former letter.

Reluctant.—White turpentine varnish is made by dissolving gum mastic in turpentine, or gum dammer may be used, but is not so good. You can purchase mastic varnish of an artists' colourman. 2. Add a little hydrochloric acid to your washing waters containing silver. 3. If your acetate bath work right, do not trouble yourself about the smell. If you have reason to think that the acetate of soda is acid, and the toning bath consequently acid, wash the prints well before immersing in the hypo. 4. Cotton velvet, or Repps, will make a good curtain, and dark blue is a good colour for a light curtain. Your specimens are very good photographically, but there is room for improvement artistically; the positives are not very good, and the effect of the curtains is bad.

Double Sulphate.—Either sunning or boiling your bath will probably restore it to working order. If you sun it, a little carbonate of soda should be added to render it quite neutral. After sunning or boiling, if you find it alkaline, you may add just sufficient nitric acid to neutralize it, without having any free acid whatever.

W. L.—For a young hand your pictures are exceedingly good. No. 2 is excellent in all respects. In No. 3 the shadows look as though there had been a slightly foggy deposit, which would account for the want of good blacks of which you complain. The other prints do not seem defective in this respect, unless it be in No. 1, which lacks detail in the blacks from under-exposure. We have known many cases like that you quote in support of our remarks on occult likeness in portraiture.

The North London Medals.—We have received from those camera-makers who competed unsuccessfully at the North London Exhibition a further communication in justification and explanation of their former protests. This communication, which consists partly of statements and arguments, and partly of offensive comment on a brother tradesman, on our contributors and correspondents, and on ourselves, would occupy about three columns of our space, and we are instructed to publish it intact or not at all. We accept the latter alternative. As we are solely responsible for the contents of our pages, we claim the sole arbitrament of what appears therein. We avoid, as far as is possible, permitting anything of a personal or vituperative character to appear, and decline communications of any kind from any one, accompanied by the condition that they shall not be subject to editorial revision. Notwithstanding the undue length of the letter on a subject the public interest in which is over, we should have inserted the letter denuded of its personalities, except so far as they relate to ourselves; these, however untrue and in whatever bad taste, we can safely leave to the appreciation of our readers, and together with the statements and the arguments advanced, may appear. If this condition be not accepted we must decline to publish the communication entirely.

E. J.—Mr. Aldis has never described in detail his method of enlarging by means of the lime-light, and is not, we believe, willing to do so.

A Tyro.—In our experience, to your first question B, and to your second question, 2; your conjecture on the subject is correct. 3. A No. 1 B lens does not cover so well, nor is it so rapid as No. 2 B. 4. The advantage consists in getting good definition with a large stop, and, therefore, rapid action with good results. 5. G. is not equal to D. 6. Yes; but still there are advantages in dealing with a principal, and we should prefer it.

The Gelatino-Iron Developer.—Mr. Cooper informs us that Messrs. Francis and Co., of No. 2, Upper Street, Islington, will supply a gelatino-iron developer made after the formula described by Mr. Cooper in our last.

Received, "The Magic Lantern; how to buy and how to use it; by a Mere Phantom;" and "Social Science, considered in its Higher Moral Aspects; by J. Antrobus."

An article on Cyanide of Potassium and its Antidotes, and several other articles in type, stand over until our next.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. W. W. Reeves, 20, South Street, Greenwich,
Photograph of Water Colour Drawing.
Mr. John James Young, 22, Edward Street, Sheerness,
Photograph of Admiral Sir Chas. Talbot, K.C.B.
Mr. William Palmer, Lynton, North Devon,
Photograph of W. Ewings, Esq., London and Western Bank, London.
F. Treble, Catherine Street, Salisbury,
Photograph of Group, Marchioness of Winchester, &c.
Photograph of Lady Maude Herbert, &c.
Samuel Davis and Co., Clonmell, Ireland,
Photograph of Eliz. Greer, Clonmel, Ireland, Lady.
Charles Nettleton, 19, Madeline Street, North Melbourne,
Photograph of starting of Burke and Wills' expedition from Melbourne, August 20, 1860.
George Greatrex, Southampton,
Photograph of Tom Thumb's Carriage, &c.
Photograph of Tom Thumb's Coachman and Footman.
E. Butler, Bath Terrace, Swindon,
Photograph of Horse named "Ely."

THE PHOTOGRAPHIC NEWS.

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POISONING BY CYANIDE, AND ITS REMEDIES.

Whilst a substance, described by Professor Taylor, in his work on Poisons, as "one of the most formidable poisons known to chemists," continues to be used with little hesitation, and less caution, in a large number of photographic establishments, and whilst we continue to hear almost weekly of some case of intentional or accidental poisoning by this poison—cyanide of potassium—it may possibly be of importance to photographers, at least, to know something of its action, and of the possibility of applying an antidote in cases of accidental poisoning. Nevertheless, in supplying this information, we again take occasion to protest against the common use of this poison by photographers as unnecessary in any case, useless in most cases, and mischievous in many. Negatives are almost invariably better being fixed by hyposulphite of soda; stains on the fingers, &c., may be easily removed by means of iodine and hyposulphite; and, for the few cases in which cyanide of potassium may be valuable, it might be preserved in a bottle, capped and tied down, amongst the rarely used agents of the laboratory.

The effects of cyanide of potassium when taken into the system are the same as those of prussic acid, this poison being just as fatal to animal life when combined with alkaline bases as when free. The symptoms occur with such rapidity and violence that there is scarcely ever time to administer remedies. The usual results are insensibility, spasmodic respiration, convulsions, with tetanic stiffness of the jaws and body, and rapid death. The symptoms sometimes occur in a few seconds, and complete their course in a few minutes. The rapidity and intensity of the symptoms are affected, of course, by the strength of the dose, a large quantity producing almost immediate death, whilst a weaker dose may permit the victim to live for an hour. From its dangerous qualities this salt is not often used medicinally, and although it is occasionally prescribed on the Continent, the largest dose, according to Professor Taylor, is a quarter of a grain; more than that might be injurious to the system, a dose of from three to five grains being sufficient to cause death. It is uncertain whether a smaller dose of cyanide of potassium has produced death; but fatal results have followed a dose of prussic acid consisting of forty-nine minims of the London pharmacopœial acid, fifty minims of which are equivalent to two grains and a half of cyanide of potassium.

As we have said, the rapidity with which the symptoms supervene, and the nature of the symptoms—the tetanic clenching of the jaw and inability to swallow—have generally rendered treatment difficult and remedies unavailing. The treatment indicated has generally consisted in the administration of protosulphate of iron, followed by stimulants such as ammonia, and cold affusion. Until recently, however, there was no record, that we remember, of a recovery from the effects of a poisonous dose of cyanide of potassium. Professor Taylor relates a case, however, of recovery from a poisonous dose of prussic acid, which is instructive. A gentleman took in mistake a drachm of hydrocyanic acid of a strength equivalent to over six grains of cyanide of potassium. Perceiving his mistake immediately, he swallowed at once an ounce of aromatic spirits of ammonia with a little water. Two minutes afterwards a solution of protosulphate was administered. Insensibility followed, and the breathing became deeper and heavier. In two minutes more, cold affusion was employed, and more sulphate of iron and spirits of ammonia were administered. Vomiting and convulsive shuddering now took place: in twenty minutes consciousness returned; in a quarter of an hour more the patient was able to walk upstairs to bed; and he finally recovered. We quote this case as having an interesting bearing on possible cases of poisoning with cyanide of potassium.

The *Pharmaceutical Journal* for October contains an article by Messrs. T. and H. Smith, which contains some interesting and important suggestions on the use of salts of iron as antidote to the poisonous action of prussic acid and of arsenic and antimony. A case is mentioned in which a lady, having accidentally swallowed a solution of cyanide of potassium, was saved by a prompt application of the antidote proposed, and some experiments on dogs are referred to as proving beyond a doubt that the remedy is complete and certain. The dogs to which the poison was administered, without the antidote, died; whilst those which received the antidote as well, recovered and lived. Some delay, however, necessarily resulted in preparing the remedy as first directed by these gentlemen, and the article to which we refer is devoted to a description of the same remedy in a simpler form, which may always be had in a few minutes of a pharmaceutical chemist. We proceed therefore to give the remedy in the words of the writers, and then add their comments on the theory involved in its operation.

Prussic acid antidote.—Take of liquor of perchloride of iron 37 minims, protosulphate of iron in crystals, as pure as possible, 25 grs.; as much water as make a solution of a protosesquisalt of iron, measuring about half an ounce. Dissolve, on the other hand, 77 grs. crystallized carbonate of soda in about half an ounce of water. These quantities destroy the poisonous action of between 100 and 200 minims of medicinal prussic acid, officinal strength, on giving first the one liquid and then the other.

Antidote for cyanide of potassium.—The antidote for this compound is the same as for prussic acid, except that the solution of protosesquisalt of iron is to be used without the alkaline solution, the prussic acid being already combined with an alkali; the use of the alkali, however, would not be injurious; a harmless yellow prussiate would be formed. In this case, in consequence of the possible presence of free acid in the stomach, the alkaline liquid should be given first,—the quantities given as the prussic acid antidote would decompose 35 grains of cyanide of potassium.

To be suitable for the antidotes, the liquor ferri perchloridi must answer to the following tests:—one fluid drachm must contain 15·62 grains peroxide of iron; ammonia must give a pure reddish-brown precipitate, without any shade of black; it must not smell strongly acid, nor, after slight dilution, give a brisk effervescence with a piece of zinc.

The writers, in speaking of the working of the remedy, remark:—

The principle of the action of the antidote is exceedingly simple and easily understood; at least, if certain theoretical views be put aside, and the reaction with prussic acid be merely considered as a simple case of double decomposition, which results in the formation, in the stomach, of the harmless compound known as Prussian blue. The formula of Prussian blue is $2\,(Fe_2, Cy_3) + 3\,(Fe, Cy)$; showing that 7 equivalents of iron and 9 equivalents of cyanogen are contained in one equivalent of the compound. To produce this compound with the prussic acid there are required 7 equivalents of iron in the form of a soluble compound, of which 4 equivalents must be in the state of persalt, and 3 equivalents in the state of protosalt. The ready means of obtaining this solution are supplied in the liq. ferri perchloridi, and protosulphate of iron or green vitriol. It is easy to find the quantity of the perchloride solution, containing in grains 4 equivalents of iron. Two ounces, or 875 grains, are contained in 10 fluid ounces of the solution. Keeping now in mind that 4 equivalents of iron must be in the state of peroxide, or perchloride, which is equivalent, the quantity of perchloride solution required in the production of an equivalent of Prussian blue may be found without any difficulty, thus:—

Grs. Iron.		Fl. oz. Sol.		4 eq. Iron.		Fl. oz. Sol.
875	:	10	: :	112	:	1·28, or 614 minims.

The 3 equivalents of iron in the form of protosalt, required for the formation of Prussian blue, are supplied as sulphate of protoxide of iron, the equivalent of which is 139; multiplying that number by 3 gives 417 grains.

It must be quite clear, therefore, that 614 minims of solution of perchloride of iron, and 417 grains of green vitriol, supply the iron in the form and quantity necessary for the production of Prussian blue; and as these ingredients contain, respectively, 6 equivalents of chlorine and 3 equivalents of sulphuric acid (which in Prussian blue are replaced by 9 equivalents of prussic acid), it is evident, as the equivalent of prussic acid is 27, that 9 times that sum is 243; 243 grains of prussic acid can, consequently, be destroyed by the above quantities; therefore, the hundredth of that quantity, or 2·4 grains (a good deal more than 100 minims of medicinal prussic acid), can be destroyed as a poison by 6·14 minims of solution of perchloride of iron, and 4·17 grains of green vitriol; but we need hardly say that prussic acid can take the place of neither hydrochloric nor sulphuric acid, unless, at the same time, an equivalent quantity of a strong base is supplied, to take the strong acid from the iron, the affinity of which is comparatively weak. Under such circumstances, the iron at once seizes on the prussic acid, and the desired result is obtained,—the formation of a harmless and stable compound. The effect is instantaneous.

The remedy prescribed, although rapidly and easily prepared, could rarely be administered to a patient in time to counteract the effects of accidental poisoning by cyanide, if the necessary delay in applying to a neighbouring chemist were necessary; we should therefore advise all our readers, who ever employ cyanide, to keep a bottle of the solution of perchloride of iron always in his laboratory. The remainder of the prescription he will always have at hand, and thus no time need be lost in case of emergency.

Of the detrimental influence on the general health exercised by the vapours of hydrocyanic acid constantly given off by cyanide of potassium, where standing in an open vessel or during use, and of its injurious local action, we have no space to speak here. We have often referred to the subject, and may recur to it again. We only add now our reiterated advice to abandon its use.

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POITEVIN'S CARBON AND ENAMEL PROCESS.

BY JOHN ANTHONY, M.D.

A description of the working details of the carbon and enamel process of M. Poitevin, as modified and used practically by M. Gobert, which I had an opportunity of seeing in Paris, may probably interest the readers of the Photographic News. I was very much impressed by what I witnessed, for the process was an extremely simple one, while the results were very charming. Up to the time I saw it, the use made of this mode of printing was for the reproduction of printed matter, and M. Gobert, who is an *employé* of the Bank of France, was occupied when I called upon him in taking copies by this method of official documents of the Bank, the fine lines of the *billets* being rendered with exquisite distinctness.

The principle of Poitevin's process is this,—that a material used to coat the plate, and dried in the dark, will, when exposed under a negative, become "sticky," or "tacky," in those parts acted upon by the light, so that when fine particles of carbon, &c., are dusted on to the plate, they become attached to the sticky portions *only* of the plate, and so build up an image.

The process itself is to take a piece of very finely ground glass (which may serve again and again), to clean it with moderate care, to coat it in the dark room with a solution of perchloride of iron and tartaric acid, pouring on as would be done with collodion, and running the excess off into the bottle, and then setting the plate on its edge to let it dry in the dark. In this condition the plate resembles in all but colour an ordinary dry collodion or albumen plate, and the printing is done by contact in the usual manner; but practice only can teach the time necessary for exposure under the negative. When the exposed plate is examined in the dark room, and especially after breathing on it for a few seconds, it will be found that where the light has reached it through the negative, the surface has become "sticky," or "tacky," in proportion to the quantity of light which has impinged upon it. If now any light, impalpable, inert powder, such as carbon, plumbago, or finely-ground and sifted enamel colours, is dusted into the plate, and gently rubbed on its surface by the aid of a fine brush, the particles will gradually attach themselves to the sticky portions of the plate, and after one or two dustings and "rubbings in," a puff of the breath will disperse the loose dust, and the picture will be seen full of detail. It may be mentioned here that if the plate has been over-exposed, it will "take" the powder too rapidly, and the resulting picture will be over loaded and heavy; if under-exposed, the effect will be a want of detail. To transfer this picture to paper, some plain collodion is poured over the plate, allowed to set, well washed at the tap, and then with water acidulated with hydrochloric acid, which has the property of dissolving the perchloride coating unacted on by light, *through the collodion film*, while at the same time it prevents the adherence of the collodion to the glass, so that when the superabundance of this acid solution is washed off, the film which holds the picture is ready for transfer to paper or porcelain.

The transfer to paper is effected by brushing over any white or tinted paper with a very weak solution of gelatine, or any gummy substance; this, when moistened just before using, and laid face downwards upon the film, and pressed upon it by means of some blotting paper, will adhere so firmly, that when it has been allowed to dry, collodion and image seem to be incorporated with the paper. But it is evident that the image so transferred is reversed, and it may be important (as in the reproduction of printed matter) to avoid this reversed position, and then a slight modification is adopted in the mode of transfer, as follows:—When the plate has been washed free from the acid and drained, a piece of ordinary white paper, cut slightly smaller than the dimensions of the plate, is laid upon the film, and then the edges of the collodion around it are delicately turned up and reversed over the back of the paper, and the film can be thus lifted off the plate and laid down on the gelatinized or gummed paper, to which a little pressure causes it to adhere.

In the first case, the carbon image, being *on* the collodion film when it was transferred to paper, would need to be protected by a layer of copal varnish; in the second case, where the image is not reversed, no protection would be wanted, as the image would be next the paper, and so would be protected by the collodion film.

M. Gobert, who, as I observed, has practised this mode of printing extensively, has communicated an article on the subject to the *Bulletin*, in which he says that "he finds the perchloride of iron of commerce to be very uncertain in its composition, and that he prefers to prepare it himself in the following manner:—He takes ordinary sulphate of iron, and treats it with ordinary commercial nitric acid so as to form a sulphate of the peroxide of iron; this peroxide of iron he precipitates by ammonia.

To prepare the sensitive fluid, he says:—"I dissolve 2 drachms and 12 grains of this peroxide of iron in as much hydrochloric acid as will make a neutral solution (though excess of acid does not seem to make any difference). I dilute with water to the bulk of 3½ ounces, and filter, and then add 2 drachms and 12 grains of tartaric acid."

Such is the material, and such is the process as I saw it easily manipulated, and apparently taking up little more time in the practice than I have done in the description; and I feel that photographers are greatly indebted both to M. Poitevin and M. Gobert for the liberality and courtesy with which they have made known all the details of the process, and pointed out its capabilities for the production of pictures in enamel—a strong contrast to the reticence of M. De Camarsac. I thought then, and I think now, that the principles on which this process depends are so certain, and the materials used are so cheap, that it promises to be of considerable value for decorative purposes in its simpler form; while there seems to be no reason why either that a transfer should not be made of the image built up in an enamel colour to the enamel plate, or else to porcelain, or that the enamel or porcelain plate should be directly coated with the sensitive fluid, and placed in a copying camera (as in the operation of making transparent positives on glass), the image of course being attainable of larger or smaller dimensions than the negative—no small advantage. This image, if rubbed with the powdered enamel colour, to be glazed in the furnace. There seems little reason to doubt that the carefully concealed process by which M. De Camarsac produces his exquisite enamels is some modification of this process, probably a slight one, and I shall be very glad to see the matter taken up and made available for the production of really unchanging impressions from the number of fine negatives we have in England, and whose detail is really much of it lost when printed on the ordinary albumenized paper. I dare say many will be very incredulous touching this assertion of loss of detail; but it is a fact. A few months ago, I had occasion to send a negative portrait to Paris, for M. De Camarsac to print on an enamel, and though I had already the very finest impressions which could be made on albumenized paper, yet these were very far excelled by the enamel, not only in the superior quality of the blacks and whites, but in the circumstance that the detail of the negative was *all* rendered by the enamel, much more than the best vision could make out in the paper proof. M. Poitevin has pointed out the application of this process to the production of enamels, and has himself made many experiments; but though M. Poitevin is an undoubted man of genius, he is by no means a good operator; I was going to say he is a slovenly one; at all events, his best enamels are far inferior to those of M. De Camarsac, as, though rendering all the details, they lack brightness, though even with that deficiency they bear a comparison with the work on porcelain I have seen by M. Obernetter's process. This tartrate of iron process is not, so far as I know, fettered by any patent, and the reason why it has not been taken up commercially lies probably in the fact that the details of the process itself have been so imperfectly known that the manipulation would seem to be invested with difficulties which really do not exist for a man of ordinary skill and energy.

Washwood Heath, near Birmingham, October 18, 1865.

ON DEVELOPMENT, AS TO ITS INFLUENCE ON PORTRAITURE.

BY M. CAREY LEA.

Photographers have been accustomed to vary their developments according to the *general* nature of the subjects on which they were engaged, employing, for example, one developer for landscapes, another for portraiture, and so on; also to use one developer in winter, and one of a different strength for summer. But the point which I now wish to take is, that all this is insufficient, and that the developers must also be varied (at least in many cases) according to the *specific* nature of the individual subject.

I shall be met here with two diametrically opposite replies from different objectors. One, that my view, though true, is not new. The other, that though it may be well enough in principle, it is a useless nicety, neither necessary nor expedient. To the first I reply that the view is not without novelty in the mode of application which I propose to make of it. To the second, that it is by far the least trouble to do work right at first, rather than to do it over again; or, worse still, to leave it ill done.

I hold that a consideration of the laws which govern negative development is sufficient to prove to us, even independently of practice, that the developer must be varied, even under identical conditions of lens, position, and illumination, according as the particular subject varies. For example, for a portraitist to develop a negative of a lady dressed in white, or in highly actinic colours, with the same developer that he would use for the same person, but dressed in black, or in other very non-actinic colours, would be, in my view, a mistake in principle. And I think that, without doubt, this might be carried still further, and the developer even be varied advantageously, in some cases at least, according to the character of the face.

It is possible that some of your readers may be inclined to smile at this as an overstrained nicety. But I am satisfied that it is by no means so. And I will ask these questions. Why do even the best photographic portraitists turn out so much bad work? And why do even the worst operators occasionally make a remarkable success? That this is so must have attracted the attention of every observant man who has turned his attention to the subject. The answer is sufficiently plain. The good operator generally succeeds, because he has established in his train of work such conditions of bath, collodion, developer, and illumination as are suitable to the average and generality of the work that comes before him. And the bungler fails because he has not. But there come before the good operator many cases for which his average system is only partly suited, and some for which it is wholly improper. The converse of this happens with the bungler; the system which is generally only fitted to produce failures will be, in some exceptional cases, exactly right, so that, by a sort of double mistake, he accidently comes right.

The clue by which the clever photographer may avoid these occasional failures, failures which cannot be removed by merely trying over again*, lies in the proper variation of his developers to suit his subject.

The principle on which this variation of the developers is grounded is simple enough. Let us suppose that a photographer habitually works, as many do, with a ten-grain solution of iron, pretty well acidified. And let us suppose that there presents herself a lady to be photographed, with a clear white complexion, dark hair, and deep-set dark eyes. This is a face of strong actinic contrasts, and these cannot fail to be unnaturally intensified by a developer like the forgoing, the nature of which is to enhance all contrasts and exaggerate them in the negative. Such a development is manifestly improper.

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* Instances where really skilled photographers have tried the same subject over and over, even on different days, and have had to give up in despair, are by no means uncommon, and many persons have never succeeded in obtaining a good likeness of themselves.

Again, let us consider a subject with yellow hair, reddish complexion, and light eyes. Here is as decided an exception in the opposite direction. Such a face exhibits a marked paucity of actinic contrasts. Can it be properly developed with a developer such as would have been best suited to the first described face? Certainly not. Its tendency to uniformity of actinic effect indicates the need of a weak developer, plenty of restraining acid, and a slow development, so that the tendency to uniformity of action may be held in check, and a sufficient contrast be obtained in the negative.

On the other hand, the style of face first above described, if treated in this way, would acquire an unnatural harshness, or at least, would lose in the portrait the charm which it had in the original. How often do we not see this result! Such a face would be best brought out by a strong developer and a rapid development; for this treatment would preserve its characteristic softness and keep down the excess of contrast which such character of face naturally tends to, in its photographic translation.

And I may further remark, that it follows from these and other considerations, that the style of dress, to be best suited to portraiture, should be governed by rules wholly different from those which apply to the toilette in its ordinary uses. In photography, there is no question whether this or that colour best suits the complexion. But the broad proposition to be laid down is the following: when the actinic contrasts in the face, eyes, and hair are strong (as in the case just above supposed), considerable contrast in the dress is allowable, and may be even advantageous. Or, if the colour of the dress is to be uniform, a dark colour is advisable. On the other hand, when there is a want of contrast in the face (as in the second described case), strong contrasts in the dress must be wholly proscribed. And if it is preferred to use a dress of uniform colour, a light shade is preferable. Because, if these rules be followed, then the character of the dress corresponds with the species of development which the character of the face demands; and, if they be neglected, the photographer (if he really understands his art) finds himself in the dilemma of either sacrificing the draperies to the face, or the face to the draperies, the one demanding for its best development a treatment diametrically opposite to that which the other calls for.

Some may consider all this too nice and too troublesome, and others may even dispute the principles on which it is based, though this I hardly think can be done effectively. I am confident, however, that they will be found to be the best for systematic use, and have had the satisfaction of finding that some more general remarks which I made on the same subject some months ago have been found of real utility by experienced practical photographers. In the last number of the *Camera Obscura*, M. d'About mentions that they had led him to change the whole system of his work with advantage. Had I not been supported by testimony of this sort, I should, perhaps, not have thought it worth while to make this more particular application in one direction of the general views contained in the paper above referred to.

That this system of work may be used with ease and convenience, it is desirable to have a developer which, by simply diluting more or less with water, will give the required conditions. I know none by which this may be effected more readily than the developer prepared by dissolving gelatine in sulphuric acid, and saturating with iron filings, as I have elsewhere described. Of course the use of such a developer is far from being essential. Developers made according to ordinary formulas, and simply differing in their strength as to sulphate of iron, and in the proportion of the restraining acid, can be used, though the advantage is with the former.

It remains for me to indicate what portion of novelty there exists in the views and principles above set forth.

Mr. Wharton Simpson was, I believe, the first to state, more than a year ago, that a strong developer tended to bring out detail. This was a very interesting advance towards the truth, and a very valuable one. I think, however, it must be held to be only partly true—true under certain conditions. In my view, the truth stands more exactly thus:—

1. A strong developer tends to bring out detail in the half tones and in the shadows of the original.

2. A weak developer tends to bring out detail in the high lights. The slow developments which are thus effected avoid the tendency which a more rapid one would have to fill in the dense parts of the negative, corresponding with the high lights more evenly.

A slow development, under the agency of a weak developer, thus tends to preserve the delicate gradations of detail in thick deposits. A rapid development, under the agency of strong developer, produces precisely the converse effect, and tends to preserve the delicate gradations of detail in thin deposits, and even may bring out actinic action so faint, that a slower development would fail altogether to act upon it, and give nothing but bare glass.

It follows therefore, that the nature of the development which is required to produce the most just and harmonious effect will be determined according to the preponderance of one or other of these conditions in the subject. It is for the photographer to note the nature of that preponderance (that is, the side to which it inclines), and to apply his development accordingly: without this it is in vain for him to expect to obtain the best results of which the subject admits.

Such, then, is development, judged by its chemical character, that of precipitation and crystallization, and applied to the purposes of portraiture.

Jottings for 1865.—No. 7.

BY A PHOTOGRAPHER'S ASSISTANT.

Remarks on the Season—Organic Matter in the Printing-Bath—Blisters, &c.

October might be regarded as the break that shunts us gently into the icy road of winter. It is the wasting twilight that ushers in sterile night. And weary Nature, yawning, longs to enter on her well-earned rest. Already does her cold breath rise in sheets of dripping mist, through which Sol's angry face is but faintly visible, and the withering grasp of Nakedness strips beauty from her hand. The leaves that anon danced, and whispered rustling music in the morning breeze, now utter plaintive crackling sighs, as they are hurled from their elevated position to be trodden under foot in seared and shapeless groups. The fields, shorn and stripped of summer beauty, seem more desolate as their faded ornaments in entangled masses meet our gaze, and the feathered denizens of the wood chant, in saddened strains, a mournful requiem on the scene of departing gladness. Nature's day is spent: her night is at hand, bidding us prepare to meet her chilling influence, and * * *

Kind reader, the foregoing remarks, you perceive, might be applied to the present style of fashionable advertising, more especially as an introduction for articles suited to the season named. Carbon, the coal-merchant, could furnish a wind-up with the price of dustless coal; or Knowadodge, the draper, might make them available to puff his damaged blankets; or Snip, the tailor, could adopt them as a change of literary diet to present to "those who don't run tailors' bills." But our business is to forge an agreeable link to connect them with a few remarks which we trust will prove of interest and profit to our readers.

To the photographer who can smile over summer gains October is a wished-for season. It speaks of pleasant reunions, cheerful meetings, with brethren of his craft, to relate experience, compare notes, describe dodges and discoveries that will at such places be ventilated, searched, and sifted. Specimens of work will be examined with interest, votes of thanks will be recorded, new members enrolled, and, in all probability, matters will jog on pleasantly. The journals will record sayings and doings, and our provincial friends can, if they please, vote themselves in the easy-chair, and go the meeting over again for their special satisfaction or instruction. Should they beg to offer a few remarks on what they conceive to be an erroneous idea advanced by the last speaker, why they have but to seize the pen, commit their views to paper, and the field through which they might advance their view is as extensive as it would have been if personally offered at the meeting. If they are ambitious, and wish to compose a paper, the same mediums are ever at their service to give it circulation. Indeed, we see no reason why a far-between society should not be started at once, each member giving utterance through some journal devoted to our art. Mr. Hypo could write his paper in Africa; Mr. Chloride might beg to differ, on the opposition side, in Australia; America perhaps supports Asia, and Europe has its say, and profits by the discussion.

It was once remarked by an eminent photographer, that men following his art wrote too much and did too little; but we are of opinion that many, who know and can do a great deal, never say anything about it, but would fain do so, if they knew how. If they cannot write well, let them do the best they can. Editors help them. We throw out the suggestion, and now proceed to treat on other matters.

To effect a saving in the precious metals employed in photographic operations many schemes have been devised, numerous discussions on the subject have been entered into, and, as a knowledge of guiding principles advances, the object desired comes nearer within reach.

Applying this remark to the subject of photographic printing, we direct attention to the fact that analysis has shown that a very small quantity of silver is really present in a finished print. Still practice proves that a comparatively large amount of the sensitizing salt is requisite to produce satisfactory results; for in addition to a certain quantity of free nitrate being necessary, sufficient to effect an instant "coagulation" of the albumen is indispensable, for on this point the quality of the picture in a large measure depends.

After frequent examinations and experiments, it was at length discovered that alcohol, nitrate of potash, lead, or soda, served in lieu of an excess of silver to assist in keeping the albumen surface intact; and lastly, it was suggested by Mr. Palmer, of Stonehouse, that gelatine should be applied to effect the same purpose.* This scheme, with certain modifications, we have recently experimented with, and our success in this direction encourages us to place the matter before our readers—in the first instance warning them against an error we have found existing among many photographers who fancy that all saving "dodges" cause the paper to rest satisfied with a reduced quantity of silver. Set aside the droppings, and we pronounce such an opinion to be an utter unsustained fallacy. Taking the average of albumenized paper in the market, 20 grains of silver are taken up by each sheet floated, the solution containing matter to effect saving, or otherwise. Where, say you, then, is the gain? Why, in the waste—the droppings and spillings—a small amount of silver sufficing for a comparatively large quantity of solution. For instance, if a 30-grain solution with foreign matter will answer equally well as a 60-grain one minus such extra substance, it stands to reason that a double quantity of bath might be made at the first-named strength, by the latter weight of silver, but the first as given possesses an advantage the other does not that contains 60 grains, because if this last quantity is requisite for the preservation of the albumen surface, it would be necessary to start with a solution of much greater strength, on account of the silver being required for double duty. But how stands it with the 30-grain bath, plus organic or other inert substance? If, in this case, the preservation of the albumen is to a great extent secured by the extra salt or organic matter, it necessarily follows that so long as sufficient silver is present to do the lighter duty, a perfect picture can be produced; but when the silver sinks below the required quantity, the picture suffers. We regret silver is the only working agent, other substances being added to destroy the solvent properties of the water, and thus prevent its too ready action on the albumen.

It should be understood that, with the method we are about to propose, a perfect print can be obtained only when sufficient silver is present to unite readily with the albumen, leaving a good margin on the credit side of chlorine and free salt. Below 20 grains is treading an insecure ground; we counsel that the safe side is chosen.

In declaring ourselves a convert to Mr. Palmer's scheme, we still have a good word to say for nitrate of soda. It has done its work effectually during the past summer, but its deliquescent properties impair to some extent its quality for winter work, and, for this reason, we sought an agent more suited for the present season.

The instructions as presented by Mr. Palmer, it will be remembered, we pronounced too troublesome for general use. We adhere to the opinion that 2 ozs. of gelatine (Nelson's) is ample for 80 ozs. of solution. We soak the gelatine in cold water; when soft and swollen it is placed in a warm place until dissolved, when it is mixed with a quart or more of warm water (this course is adopted to preserve the solution from gelatinous strings forming). The silver is mixed in a separate vessel and added to the organic mixture. After floating the usual time we find the albumen preserved. The picture is bold and brilliant, tones easily, and mealiness is less liable to appear. During the course of our experiments we have stumbled over curious facts that neither agree with our own preconceived notions, or the remarks offered on the subject by Mr. Hardwich. We expected to find a combination entered into between silver and gelatine, but no such union ensued. The solution remained colourless even in bright sunshine. A plate of glass, coated with the solution and dried, when exposed to light, scarcely exhibited any change. On plain unsalted paper it assumed a salmon hue, but no deeper; but a small pinch of salt altered matters; under such conditions, in each case mentioned, the change to ruby tint was rapid, thus showing that nitrate of silver acts on gelatine only by catalysis, when a chloride salt is present, and we conclude from this fact that the samples experimented on by Mr. Hardwich contained a small amount of chloride of sodium, a substance well known to exist in most samples of the gelatine of commerce.

When the necessary conditions are present, the organic matter, under the influence of light, combines with silver, and in its modified state is insoluble, but in the case of vignettes, the gelatine on the white cannot resist the action of hot water. Cold water does not affect it to any deteriorating extent, and it is a curious fact, that whilst the presence of gelatine in the silver bath preserves the albumen, when a piece of albumenized paper is floated on gelatine *only* in solution, the albumen surface dries dead, although the opposite side becomes glazed, which seems to prove that albumen is dissolved, notwithstanding the gum-like nature of the substance on which it is floated.

What a pity we are unacquainted with Latin, as it otherwise would enable us to wind up with a grand flourish! But failing this we will, by way of finish, say a word or two on the subject of blisters, which we learn, by a recent number of the News, still make their appearance to plague photographers.

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* A further interesting communication on this subject from Mr. Palmer will appear in our next.

The appearance of blisters has been attributed to many causes; but we are inclined to believe that the right and only cause has escaped unnoticed. All who are acquainted with albumenizing operations are aware that special attention is necessary to the temperature in which the paper is dried. A temperature too low imparts a dull surface, in consequence of the albumen being absorbed by the pores; but should the heat be too great, it produces an opposite effect. The surface is highly glazed, because a very small quantity has penetrated the paper. In such condition it appears very fine to the eye, and is able to pass floating and washing unchanged; but when the hypo is brought to bear on it, the interstices are penetrated in its search for food, the albumen swells, and in spots where its anchorage is feeble it gives way, and blisters result. When washed and dried the watery intruder is expelled, and an even surface is restored. The cure rests with albumenizers, for, if they only secure the happy medium where firmness and glaze are at the same time preserved, we shall hear no more complaints of blisters. There is no effect without a cause; and that cause, to the patient observer, seldom remains long concealed. We have spun our length; our remarks on gold and lime toning must, therefore, stand over for our next.

Recent Patents.

Amongst the specifications of patents which have been published during the last few months we make extracts from the following, which will be interesting to photographers:—

DOUBLE BACK-GROUNDS AND VIGNETTING IN THE CAMERA.

Mr. Napoleon Sarony has entered two specifications relating to the back grounds of portraits. The first, which only received provisional protection, was for vignetting in the camera, a subject which received some discussion a few months ago; and also for securing, on the same negative, a sketchy background like that of a drawing in the manner of Richmond, the well-known portrait painter. The method, as described in the specification, is as follows:—

My invention has for its object the production of "cartes de visite," or other photographs similar in appearance to crayon drawings, ordinarily known as Richmond drawings, and crayon heads. I effect this by a double process of vignetting direct within the camera; firstly, I produce the bust of a person sitting, or other object required, vignetting that portion only that is seen in the finished picture by the use of a properly graduated glass suspended within the non-focal rays of the posterior of the lens, thus protecting certain portions of the sensitive plate from the action of the light; secondly, I place before such portion of the said plate as has already been acted upon by the light an inverted or reverse vignetting glass in such a manner as to secure the said part from any further action of the light, whilst that portion of the plate previously unacted upon is now brought into the focus of a drawing which is placed before the lens, and which represents the afore-named Richmond or scroll drawing, the result being a scroll vignette or photograph. The same effect may also be obtained by the process known as "double printing."

The next process received full protection, and is as follows:—

This invention consists of improved modes of imparting to photographs the appearance of drawings or engravings; this I effect by printing upon the photograph a background or foreground in sketchy touches, lines, or tints, such as artists finish their crayon or other drawings with, or as engravers produce their tint; and for this printing I employ photography, lithography, copper-plate, wood engraving, or any other suitable method; or, by another mode, I print the touches, lines, or tint, upon the paper upon which the photograph is to be taken, leaving the space for the portrait or picture, which may be subsequently produced upon it.

In producing this effect by means of photographic printing I first proceed to obtain the negative picture of the sitter or other subject in vignette in the ordinary well-known manner, and I then take a second negative upon glass: this second negative consists merely of the hatching or sketchy lines photographed upon the glass from a chalk, pencil, or other drawing of such lines; I then take my picture in vignette and afterwards by means of the second or etching negative photograph the lines upon the picture, the light being prevented from acting upon the face of the portrait, or upon any desired part of the picture, and developing the lines only, by blocking out such parts as should not have the lines at the back of the vignetting glass; or, by another process, I can produce the effect of etched vignettes by etching the lines by acid upon the usual vignetting glass, employing if necessary thin varnish or any other suitable medium as a coating for the etching lines, and to produce half tints, if the crude lines should print too darkly; or I can coat the vignetting glass with japan varnish, then scratch the etching lines through the varnish, and produce the half tint, as above described, by coating the lines with thin varnish or any other suitable material. To produce the same effect by other modes of printing, such as lithography, copper-plate, or wood engraving, I merely print the lines from the stone, plate, or block, upon the paper upon which the photographic picture is to be taken, or after it has been taken.

Having thus described the nature of my said invention, and the manner in which the same is to be performed, I claim, without limiting myself to these precise details, the improvements in the production and treatment of photographic portraits or pictures, in imparting to them the appearance of drawings or engravings, by the means and in manner herein more fully set forth and specified.

IRON PRINTING PROCESS.

A patent, stated to be "manufacturing and applying prussiates of ammonia, communicated by Arthur Baudesson and Paul Howzem, was recently sealed; as will be seen in the following extract, its chief interest is that of a photographic iron printing process:—

Application to photography upon paper, textile fabrics, and otherwise.—The paper is sensitized,—

1.—Either by a bath of ferri-cyanide of ammonium or ferro-cyanide of ammonium, or a mixture of these two salts.

2.—Or by a bath of prussiate of potash or other prussiates.

3.—Or by a bath of prussiate with a base of iron at the maximum, and of organic acid salts of iron.

After exposure to light the image appears in blue, and the whites are removed by a simple washing with water. The tone is sharpened by an acid bath, or bichloride of tin or other suitable chemical agent.

4.—Or the paper may be sensitized by a bath of double salt of iron, and of ammonia, an oxalate, a tartrate, a citrate, or otherwise. The image is developed after washing in a bath of weak acid, and of yellow prussiate of potash, to obtain the blue tints.

Tannin yields black tints. Sulpho-cyanide of ammonium or of potassium yields blood-colour tints.

Quick bath,	Ferri-cyanide of ammonium ...	10 parts
	Citrate of iron	10 ,,
	Water	100 ,,

The above are good proportions, but they may be varied, as also the agents constituting the baths.

Application upon textile fabrics,—

Blue colour.—The fabrics are printed or impregnated with,—

Ferri-cyanide of ammonium ...	10 parts
Ferro-cyanide of ammonium ...	20 ,,
Water	200 ,,
Or ferri-cyanide of potassium	10 ,,
Citrate of iron	20 ,,
Water	200 ,,

Quick bath,—

Ferri-cyanide of ammonium ...	10 ,,
Citrate of iron	10 ,,
Water	200 ,,

The image appears in a green blue. After washing the whites are clear, and the image is brought up for half an hour in a solution of tartaric acid at 10 per cent., dried and washed.

Black.—The blue image is dyed with logwood, to which a small quantity of glue is added, then washed, and is brodght up in slightly soapy water, next washed, and again brought up in a similar bath.

Violet.—The blue image is decolourized in a bath of carbonate of soda, is dyed with madder, and is brought up by chloride of lime, and soap bath.

Bronze.—The image is decolourized as before, is dyed with madder and quercitron, and is brought up in a bath of soap.

Olive and Brown.—The image is decolourized, dyed with quercitron, and is brought up in a soap bath.

I do not limit myself to proportions, nor do I restrict myself to the matters composing the baths. By employing other baths of colouring woods or matters the tints and colours may be varied. I have deposited, upon textile fabrics and other suitable substances, iron mordants obtained from a mixture of perchloride of iron and tartaric acid, of double oxalate of iron, and of ammonia, and other mixtures which are capable of taking the same colour by dyeing. In dyeing for pale blue (bleu vapeur). the prussiates of ammonia possess the property of becoming decomposed by the simple effect of vaporization, without the addition of oxalic acid or of tartaric acid, or the aid of ammoniacal salts. I have succeeded in depositing all the mordants generally used in the manufacture of printed textile fabrics, such as mordants of alumina, whereby red, rose, and yellow tints are obtained.

By way of example, I proceed to describe more clearly the manner of applying photography upon textile fabrics.

Blue colour.—1st.—Impregnate the fabric, which should be well bleached and without any dressing, in a bath composed of 100 parts of water, and 6 to 10 parts of yellow salt (sel jaune), according to the intensity of tone to be produced.

2nd.—Stretch the fabric and leave it to dry in a hot place.

3rd.—Expose it to light, under an ordinary photographic plate, until the blue colours, which become developed, assume a metallic aspect. During sunshine the exposure should be from 15 to 30 minutes, according to the state of the plate.

4th.—After exposure, wash the fabric carefully, and let it remain for half an hour or an hour in water.

5th.—Wring it well, and soak it in a bath composed of 1,000 parts of water and 20 parts of sulphuric acid. Leave it in an hour in this bath, then wash with water.

6th.—Soak it for about an hour in a bath composed of 1,000 parts of water, 10 parts of hydrochloric acid, and 10 parts of bichloride of tin, then wash it in water.

Black colour.—Perform the first 5 operations last above described, except that instead of from 6 to 10 per cent. of yellow salt employ from 3 to 6 per cent. to impregnate the fabric.

Then, 1st, dissolve in a quart of boiling water from 30 to 80 grains of gelatine glue, and add to this solution as much logwood.

2nd.—Boil the fabric half or three quarters of an hour, then wash with water.

3rd.—Boil in a bath composed of 1,000 parts of water and 5 parts of soap until the whites appear, then wash with water.

By modifying the manipulation, and the nature of the dyeing baths, I obtain different shades of brown, violet, red, yellow, &c.

Whatever be the number of pieces of sensitized fabric exposed at the same time to the action of light, they may all be submitted at the same time to the operations above described; thus 50 or 100 pieces require no more time than one piece.

The invention also consists in the manufacture of prussiates of ammonia necessary in the applications hereinbefore recited, and for other uses by making sulphate of ammonia act upon prussiates of potash; thus there are obtained by double decomposition sulphate of potash and prussiates of ammonia. The sulphate of potash crystallizing first, the mother waters retain the prussiates of ammonia which crystallize afterwards. To obtain red prussiate of ammonia (ferri-cyanide of ammonium) I treat 200 pounds of red prussiate of potash with 80 pounds 7 ounces of sulphate of ammonia. To obtain yellow prussiate of ammonia (ferro-cyanide of ammonium) I treat 200 pounds of yellow prussiate of potash with 124 pounds of sulphate of ammonia.

PHOTOGRAPHIC PRINTING ON CANVAS, &c.

This invention is a communication from Jean Nicolas Truchelut, and received full protection.

The invention consists of certain improvements in photography for obtaining images direct on cloth and other materials. Cloth or canvas for paintings is generally prepared by means of a layer of oil submitted to a long dessication before executing the work of the artist upon it.

Instead of a layer of oil as a first preparation, a more complete result is obtained by employing virgin wax or spermaceti, to which is added about eight to ten per cent. of resin, that is to say, five of ordinary resin, and five of elemy; it is dissolved in essence of lavender to the consistence of a thick syrup, which is mixed afterwards with carbonate of lead, and is used in that state as a coating on the cloth. The choice of cloth or canvas is of great importance. I prefer that in which the grain is fine and regular. After having extended the cloth on the frame it must be soaked with the product above mentioned. When the cloth or canvas is perfectly dry it must be presented to a cinder fire; or I lay it on a plate of heated cast iron, and over the whole surface must be spread quickly a thin layer of very pure wax (I prefer white) to which has been added ten per cent. of the resinous substances, as herein-before stated. The wax has then become a waterproof surface, on which the collodion must be spread; it acts in the same manner as on glass, when it is employed to make a negative or a positive; if in this state the proof was to remain or merely to be varnished, it will be liable to the same results as with ordinary photographs, and the destructive effects of the photogenic agents existing in the nature of the collodion, the albumen, or of the gelatinous substance will soon appear. A very simple means can be employed to render the proof indestructible. As soon as the picture is insolated, developed, and fixed or pasted over, it is allowed to dry for some days; then a flat iron, with a long handle is moderately heated and passed behind the proof over all its surface, the frame being placed in such a manner so as to face the proof, which, being in contact with the heat, presents a most beautiful appearance of varnish. The wax. by melting, covers the proof, crosses the fibres of the collodion, and forms one body with it, and at the same time with the first layer of paint; in short, the proof becomes an entire homogeneous substance with the layers of paint, oil, and collodion. The photograph on cloth in this state is obtained, but may be further finished by the painter.

It will be perceived that the object of the invention consists in the application of virgin wax, or of its compounds, or of spermaceti or cacoa butter, all these substances forming one body with the proof by submitting them to a sufficient degree of heat, whether obtained by means of collodion, or gelatine, or even albumen, by the charcoal process.

I will now describe the manner of operating at the moment of producing the image or picture. The glass is put in its place as well as the negative and objective, the cloth is fixed to an easel, the distance is regulated according to the size of enlargement, the focus is ascertained, and the objective is covered by means of a yellow glass obturator without disarranging anything; the cloth is taken off, and the layer of collodion spread over it. As soon as the latter reaches the degree of dryness required, and which any operator is able to judge, the sensitive plate is put into a silver bath for about five or ten minutes, then the cloth is replaced in the same position it occupied, and the objective is uncovered. The duration of the insolation can only be determined by experience; it may last from five seconds to five minutes, according to the thickness of the image, the intensity of the sun, or the power of the instruments. When the proof is slightly indicated the impression may be observed by means of a light provided with a yellow glass; it is then immediately developed, fixed, and washed as usual. I allow the image to dry one day, and even more if it be possible, and pass it over the fire, as I have hereinbefore stated. For the proofs on glass I use collodion preferably to the iodides of ammonia and potassium mixed in equal quantities. The collodion is spread with rectified alcohol, the quantity of which I increase according to the surface on which I operate.

The silver bath I prefer is composed as follows:—Sixteen hundred grains of distilled water, one hundred and thirty grains of melted nitrate of silver, one hundred and thirty grains of crystallized acetic acid.

For the development I use a quart of rain water, to which I add one hundred and thirty grains of gallic acid, and from three hundred to six hundred and fifty grains of crystallized acetic acid. I fix by saturation with hyposulphite of soda.

I give to the proof a blue shade to imitate engraving by using sixteen grains of chloride of gold for two quarts of distilled water.

Having thus described the nature of the said invention, and in what manner the same is to be performed, I wish it to be understood that I do not confine myself to the precise details herein laid down, as the proportions or the agents may be altered without deviating from the principle of the invention; but what I claim is the application of virgin wax, spermaceti oil, or other similar substances, or their compounds, on canvas, cloth, wood, or other like materials, to form together one body with the image produced on such layer, as herein before described.

Correspondence.

THE GELATINO-IRON DEVELOPER.

Dear Sir,—I am much obliged to Mr. Cherrill for his suggestions in your last number with regard to the new developer; but in respect to the question of boiling solution No. 1, I think he must have slightly misunderstood my directions. From his letter it would seem that he thought I boiled the solution before neutralizing, but upon reference to my paper you will see that such is not the case. The raising to the boiling point by artificial heat is unnecessary, for a reason not given by Mr. Cherrill; it is this, that the union of the ammonia and dilute sulphuric acid, whilst the latter is being neutralized, produces a temperature very short of boiling heat.

The suggestion of adding three drachms of gelatine to the sulphuric acid, instead of two drachms, as in my published formula, is a very good one, and one that I have been working upon for some days past. But, at the same time, I must call attention to the fact that gelatine dissolved in acetic acid possesses very different physical properties from gelatine dissolved in sulphuric acid. The former gives a thick viscid solution; the latter, one that will easily flow through their filtering paper.

One object that I had in view in adding the excess of gelatine to the solution of glycocine, instead of separately dissolving it in dilute acetic acid, was to form a more limpid solution.

My experiments are proceeding very satisfactorily, and I hope soon to be able to present my brother photographers with a perfected formula.

I have forgotten to answer Mr. Cherrill's P.S.; but this is soon done. With the developer given by me, in my short paper, I could obtain as much detail, and sometimes even more, as with a solution containing 15 grs. sulphate of iron, and 15 minims of glacial acetic acid to the ounce of water. I have sometimes obtained more detail with the new developer when operating upon an under-exposed plate, because the new developer will allow of the development being forced to a great extent without any danger of fog. It must be obvious to all that the developer must be altered to suit circumstances; the formula I gave contained a large proportion of restraining agents, as it was one in use during the excessively hot weather that we had some few weeks back. Now that the temperature is so much lower, a larger proportion of sulphate of iron, and a less of the mixed solution, may be used advantageously.—I am, yours truly,

H. Cooper, Jun.

30, *Highbury Grove, Oct.* 23, 1865.

THE NEW RELIEF PRINTING PROCESS.

Sir,—Although having determined to carry on no further correspondence, in answer to Mr. Swan's letter, I cannot let it pass over without drawing your readers' attention to the amount of egotism displayed in the whole composition.

One would imagine after perusing it, that all my thoughts, actions, and ideas, as well as your own, were equally well known to him.

Take the following instance. He says:—"It seems all but certain that you would have looked upon the gelatine impression which he showed you with the same indifference with which he regarded it, if my scheme of the new printing process had not previously been impressed on your mind, and my better results known to you." Would not this lead anyone to suppose that it was not merely the fact of a new style of printing having been brought under your notice, but that its being Mr. Swan who had shown it you constituted its chief novelty, and caused you to write an article on the subject? Again, he goes on to say, "There can, I think, be little doubt of this, that although Mr. Woodbury had produced impressions more or less like mine, yet he did not see in them what I saw and led you to see—the germs of a new and valuable process." Now, how could he know what I saw and thought on the subject? What I did see was an entirely new principle, applicable to many purposes, some of the applications of which I took the first opportunity of showing you, and which novel principle I had already patented before having even heard of Mr. Swan's name in connection with the matter.

He says I am incorrect in assuming that he might have kept his secret indefinitely. I am glad to hear that he did *intend* to publish it; but it *was* published as the result of my communications. This the public know; but they have no means of knowing when it would have been published but for my communication to you.

As to the ridiculous idea (as he calls it) of the prints being described as transparencies, anyone having seen the process will know that the coloured gelatine as it lies in the mould is nothing but a most delicate transparency, and the material to which it is transferred, whether paper, glass, or porcelain, does not render it the less so; in fact, the paper in this case serves merely as a white body to show the transparency of the coloured gelatine, in the same manner as the light would do if the picture were formed of coloured gelatine on plain glass, or without colour in porcelain.

In no other printing process would this term apply, as the ink used could never form a transparency, owing to its equal opacity throughout.

Mr. Swan says that the definition "'So that when viewed as a transparency, the varying thicknesses of the material will show the picture or design,' was not originally intended to apply to the new prints;" that is, he assumes to know better than I do what I meant, and better than my patent agent knows what he meant. I am sorry, however, that I cannot accept his conjectures as to my meaning in place of my own knowledge; and notwithstanding the hard words thrown at me, such as, "a deliberate attempt at metamorphosis," "effrontery," &c., with all due deference to his superior sagacity, I prefer not only my knowledge of what I meant to his, but also my own definition of the pictures in question. I affirm now that the best generic designation or description of the new process is "a picture formed of different thicknesses of a semi-transparent material, whether coloured gelatine or porcelain is immaterial to the generic character."

Finally, Mr. Swan thinks it would be to my credit to abandon my own knowledge of facts for his supposition of what might have been facts; to state that my instructions to my patent agent meant nothing; that my expenditure of a large sum of money in securing various patents to protect my labour, all meant nothing whatever; and that my sole claim to the process consists in my energetic prosecution of *his* ideas. As I have not entirely lost my senses, I really cannot oblige Mr. Swan by making all these concessions in his favour. In conclusion, let me ask one or two questions on the subject, which, perhaps, Mr. Editor, you or some one else may be able to answer, as I cannot. In what way could the "public interest" be served by Mr. Swan's possessing the patent of the process instead of myself? Did Mr. Swan intend to give the process to the public, and if so why did he bind you to secresy? Did he give his carbon improvements (certainly less important than this process) to the public unpatented? Does the fact that he has just patented some improvements in printing surfaces, by the aid of photography, imply a regard for the public interest, or for his own interest.—I am, my dear sir, yours truly,

Walter Woodbury.

Worcester Park, Oct. 24*th*, 1865.

[We do not think that the public interest will be served by continuing this discussion further; here, therefore, it had better cease.—Ed.]

IN JUSTIFICATION AND EXPLANATION.

Sir,—We, the undersigned, venture once more to renew and substantiate our protests against the camera award of the jurors of the North Eastern London Exhibition, feeling that, if you are really as impartial as you claim to be, that you will court, rather than shun, that fair and open inquiry into the merits of our grievance which is all that we demand. It is but reasonable to consider that no person would take the trouble and go to the expense of competing for a prize which they believed they had no chance of winning, and that those who considered they might win that prize were disappointed when they failed in doing so. We were disappointed. Would it be creditible to us if we had foolishly competed for a prize we had no chance of obtaining, and were therefore not disappointed? There is no shame in failure when a project has been undertaken with fitting means for the end.

According to the report this award was *for excellence of design*, and the camera pre-eminently possessing this quality was a portable camera, with a folding tailboard packing into small space, permitting the use of lenses of long as well as very short focus without inconvenience, being readily adapted, &c., &c." This camera is next described as having "the focussing screen hinged instead of detached, the shutter of the dark slide opening laterally instead of vertically, and greater rigidity and strength, combined with portability and lightness."

These claims, then, constitute the "excellence of design" for which a medal was awarded; and it is for us to show that all the features were in existence before the medallist manufactured the camera in question; and that, therefore, this medal was unjustly awarded. We have, therefore, regarded the facts of which we shall speak as too well known to need demonstration.

1st.—Folding tailboards of exactly the same construction were in existence some time previous to 1851, and were first made by M. Lerebour, of Paris, with a rack and pinion adjustment for focussing. For years these tailboards were common, but their want of rigidity, and the introduction of bellows cameras, caused them to be abandoned.

2.—*Hinged focussing screens* were in fashion years ago, but it was found that during exposure they acted as sails in the wind, and caused vibration.

3.—Bellows cameras were in use of various sizes, including stereoscopic, in 1856.

4.—Movable partitions were in existence about the same time.

5.—*The horizontal motion of the shutter* must be an old acquaintance with all photographers of ten years' standing.

6.—The swing back. Hundreds of photographers know that this, as used by the medallist, originated in the establishment of Ottewill and Co. long before its adoption by him.

7.—The focussing screw, with folding bottom, was first applied to the purpose it serves in cameras (made by Mr. Wood, optician, Cheapside) seven years ago.

Giving these features of the prize camera to their proper owners, where shall we find "excellence of design," or what the medalist calls his "originality of design"?

We select a few proofs from those least open to dispute, namely, such as have appeared in print and remained unquestioned.

In the *British Journal of Photography* for July 2nd, 1860, a leader by the editor, Mr. G. Shadbolt, one of the jurors, calls attention, as a novelty, to a stereo-camera by Mr. Hare, of which it is said, "this camera is on the bellows principle; and though, as a rule, we do not prefer this form, on account of its liability to vibration, we think that in this instance the instrument is free from that defect. The adjustment for focus is very conveniently arranged by means of a screw at the back." Mr. Shadbolt then calls attention to "a contrivance, by the same maker, for an economical swing back." The meeting at which this camera was exhibited took place on the 25th of the previous April, and the report thereof asserts that "the camera, in its present form, received general approval." "The Editor of the Photographic News" (yourself, sir) was present on that occasion, and examined the camera, as also did one of the present editors of the *British Journal*, Mr. George Dawson."

The same camera as the above, differing only in size, was described in the Photographic News for September 5th, 1862, as light, portable, and of excellent material and workmanship, "with screw for focussing from the back," and with "*the central partition* movable, so that a view may be taken 7½ by 4½ with a suitable lens."

But if even a more conclusive proof be wanted to show how little claim Mr. Meagher has to the design for which he has been awarded a medal, to you, yourself, Mr. Editor, must we appeal for it. Speaking of this identical camera, you say, page 518 of your Magazine, in the Number for October 31st, 1862, "A new binocular stereo camera, manufactured by W. Meagher, and designed some time ago by ourselves, is exceedingly complete and convenient, and having now used for some time the first one made, we are well satisfied that it forms one of the most complete equipments possible for the amateur or professional photographer." We will not throw back the charge of egotism which you have so liberally favoured us with, for daring to speak not half so boldly in favour of *our* work as you do of yours in the above extract, nor will we insinuate that a juror's mind would naturally be biassed in favour of his "own design," but, nevertheless, we must remind you that you examined the camera described by Mr. Shadbolt, and only differing from that in question by the want of a folding tailboard, which is considered objectionable, at the North London Association, and approved of its design as Mr. Hare's, in the year 1860; that you claimed that design as your own in 1862; and that you awarded a medal for it as Mr. Meagher's in 1865. Possibly, sir, you have a very bad memory; probably Mr. Shadbolt's memory also failed him; we believe it did; but you must admit that in the face of the frequent loudness with which you give undue prominence, as we believe, to the medallist's name and work in your Journal, and in the face of the medallist's cameras having been favoured with a separate or private inspection (this is admitted by "An Old Photographer"), to be at which jurors must have come from Hornsey, Twickenham, and Highbury, taken with the fact that while our letters, being mere protests, have been refused insertion in your pages, the medallist's, being purely devoted to self-glorification and of his wares, were inserted, justify the protest we have made, and are, as you see, prepared to stand by.

We desire also to say a few words on the letter you have published from the medallist. In that letter he denies that he had a private interview with the jurors; but the "Old Photographer" says he had. In the same letter your correspondent says, "This is not the first time that my goods have been considered superior to my protesting neighbours', not only for quality of workmanship, but for *originality of design*," &c.; and adds, "In 1862 mine was the only portable binocular camera with movable centre partition, hinged focussing screen, and folding bottom with screw adjustment, for plates above the stereoscopic size, &c., at the International Exhibition." But we have shown that such cameras were exhibited in every respect identical, folding bottom excepted. See Photographic News, September, 5th, 1862, page 424; August 29th, page 413; and *British Journal of Photography*, October 1st, 1862, page 368.

Messrs. Ottewill, Collis, & Co. desire for their own parts to protest against the charge of what you call "the richest piece of egotism you ever met with." In the letter you quoted, they did not say, "We consider ourselves to be competent judges," but, *as manufacturers* (having, *perhaps*, some repute), we consider ourselves to be competent judges, *i.e.*, of such manufactured articles, which is a very different thing. Why did the jurors claim to be judges of photographs? Was it not because they were photographers? Did they not state that they were "chosen for their 'culture and experience' in the art?" In their own business, Messrs. Ottewill, Collis, and Co. also possess culture and experience. Why, therefore, should their claims to be considered judges be ridiculed while the jurors' claims are expected to be received with such unquestioning faith?

Trusting that by inserting this necessarily lengthy communication you will do justice to those who have always exerted themselves in support of photography and photographic journalism,—We are, sir, yours obediently,

The undermentioned Exhibitors—

Ottewill, Collis, & Co.
George Hare.
A. King.

[This letter, denuded of the personalities to which we referred in our last, is still much longer than its interest warrants us in inserting, and adopts more license in its statements and comments than good taste would dictate. But as we make allowance for disappointed feelings, we trust our readers will excuse the amount of space devoted to a matter chiefly of interest to the writers. We shall briefly comment on one or two of the statements, first remarking that the writers are guilty of a grave error in addressing us editorially as having had the control over the decisions of a jury consisting of five independent gentlemen, each one of whom we believe to have been simply actuated by a desire to do strict justice to all the competitors. There is, as the writers state, no shame in failure; but there is folly in not receiving with quiet dignity the result of a competition into which, with all its conditions, they voluntarily entered; and there is shame in imputing unworthy motives to gentlemen who conscientiously discharge a thankless task imposed upon them. The historical *résumé* of the origin of various camera adaptations simply proves that the various parts of Mr. Meagher's camera were in existence many years ago, and that many of them were abandoned on account of their disadvantages. The merit of Mr. Meagher's camera consists in such a combination of these parts as secures, as far as possible, their advantages, and minimizes their defects. Our own knowledge of the history of the camera in question induces us to believe that it was the first in which all the parts were so combined. It was, as our correspondents suggest, primarily designed by ourselves, but our suggestions were so carried out, and have since been so much improved upon, as to make the camera essentially Mr. Meagher's own. The medal was not given for novelty; but we believe that the camera has been essentially improved since the Exhibition of 1862. The charge of giving undue prominence to Mr. Meagher's name is simply nonsense. We never, as our readers know, recommend the works of any especial maker in these columns, and never mention any manufacturer's name except in connection with something brought under our attention for notice; and for such notice our columns are equally open to all makers. The medallist had not a private interview, nor did the "Old Photographer" admit anything of the kind. The goods were by a mere accident examined on a separate occasion, such circumstance not affecting the decision in any way. Without discussing the modest claim of some of the protesters to be the best judges of the tools with which photographers ought to work, we may simply mention that they were not appointed to be judges, and the jurors were. This makes all the difference in the value of the decisions. We exceedingly regret that disappointment, probably stimulated by ill-disposed persons for party purposes, should have betrayed these firms into an unwise position, and trust now that, having had full expression to their views on the matter, we shall hear no more of it.—Ed.]

Photographic Notes and Queries.

Modified Fothergill Process.

Sir,—Mr. Ackland's mode of working the Fothergill process will, I have no doubt, be found a very good one; but I think the same good and certain results may be arrived at rather more simply. About five years ago I printed some stereoscopic transparencies on glass by the Fothergill process, and the plan I pursued was this:—After sensitizing the plate, I placed it in a glass dish just large enough to hold it, and containing only enough distilled water, with a few drops of glacial acetic acid, to cover it. After washing the plate in this, and slightly draining it, I poured on the usual albumen solution, equal parts albumen and water, and a few drops of glacial acetic acid (no ammonia), and without draining the plate I again placed it in in the dish in which I had washed it, and tilted it about for a minute or so, then thoroughly washed and dried it. The result was good and certain, and appears to have been so from the same reason as Mr. Ackland's, and the first careful washing is rendered unnecessary.

I never tried this plan for negatives, as I always then used the Taupenot process, but I believe it will be found the very best mode of working dry plates yet discovered. I have made trial of almost all the dry preservative processes, and consider the tannin one the least reliable of all. I have lately used Hill Norris's plates, which give superior results to the tannin ones, and it seems almost impossible to fog them in developing, which I am inclined to attribute to the preservative solution containing a portion of glycocoll.—I am, sir, yours faithfully, J. A. Miles.

Fakenham, Norfolk, 21*st Oct.*, 1865.

[The plan described by our correspondent will, we have no doubt, give good results in the hands of a careful operator; but, as will be seen, the difficulty consists in the uncertain amount of silver left in the film after a partial washing. If the proportion of water, the time of immersion, or the amount of agitation be varied, the result will vary; and the advantage of Mr. Ackland's method consists in the certainty it secures. The extreme sensitiveness of the plates, and the excellence of the negatives, were such as we have rarely seen.—Ed.]

Blistering of Rive Paper.

Sir,—In a recent number of the News there was a letter from a gentleman signing himself "Quarto," in which he complained of his paper blistering. I have myself been a sufferer from the same cause.

Of course a great deal depends upon the paper; but, by the simple rule I follow, I have entirely overcome the difficulty. It is this: I *do not make the hypo warm* (I believe the sudden change from the warm to the cold causes blistering in a great many cases); and also at the time of mixing *pour in a little spirits of wine* (I generally put in about half an ounce to every ten ounces of hypo). I think that if "Quarto" tries this plan he will not be troubled with blistering any more.

I find Mr. Sandford's paper, both *Saxe* and *Rive*, most free from any of these troubles.

Hoping this will not be encroaching too much upon your valuable space, believe me to remain your obedient servant,

Alcohol.

Portrait Lenses for Magic Lanterns.

Sir,—Many photographers, no doubt, amuse themselves during the long winter evenings with the magic lantern. I know the use of a photographic lens for the lantern has been mentioned in this Journal before; but it was not as being superior to the regular one. I constructed one last winter with a quick combination, three-and-a-half inches diameter (no stop), and nine inches focus from back lens. The front and back lenses in this combination are nearer to each other than in the other sizes. I used a condenser also three-and-a-half inches diameter, I happily had by me, consisting of a single double convex lens. I placed the greatest convexity towards the lamp (an important point). I tried this against a lantern of the ordinary construction, but of the best make, with compound condensing lens (three-and-a-half inch), achromatic object glass, oil argand lamp with silvered reflector. My photographic lantern was illuminated by a camphine passage lamp, wick 1⅛ inches wide—certainly a much superior lamp to the argand oil ones in use for the purpose—but no reflector. The difference was immense. The latter lantern was ten times more brilliant than the orthodox one, more sharp, and a larger field. If the image of both were thrown on the same screen, the latter, of ordinary construction, became almost invisible. The difference was as great as that between the lime light and the oil lamp. I tried a quarter-size lens, but the illumination was not much better than the ordinary lantern. Why do not the opticians turn their attention in this direction? There is a good opening, and the lantern is in want of the improvement.—I remain your obedient servant, T. S. Reeves.

Plymouth, October 19th.

Caution to Photographers.

Sir,—Will you permit me, through the medium of the News, to put your readers on their guard against a swindle which is being pretty extensively practised on London photographers? The plan usually adopted is as follows. A gentleman writes from the country (in my case it was from Brighton) to say that he has an only daughter with him, whom he fears is in consumption; he has no portrait of her, and would willingly pay any price to obtain one. He concludes by requesting the photographer to send a few specimens both of cartes and larger sizes, which he promises to return. He certainly must be very hard to please, for though, to my knowledge, he has received specimens from three first-class houses, he has not favoured either with a commission. In every case, however, he has forgotten to return the specimens. Perhaps by giving this publicity it may prevent others from being served in the same manner as yours obediently, A Brompton Victim.

P.S.—How is it you have not treated your readers to an article from Mr. Cussans lately? I hope we have not seen the last of his clever sketches.

[We hope shortly to publish something further from the pen of Mr. Cussans.—Ed.]

The New Organic Iron Developer.

Sir,—I see the organic developer is attracting some attention just now, and I have been very carefully trying it, from the different formulas by Mr. Cooper and others. The first thing that struck me was that the results of the developers, and one like you first described to me, having a simple addition of ordinary gelatine, are apparently identical, whilst Mr. Cooper's is a very troublesome operation. But the real question is, whether any advantage is gained over the usual method of development.

You will perceive that the method of trial and comparison that I adopt is eminently fair. I mark a plate down the middle with a diamond ready for breaking, and expose behind a pair of portrait lenses. After exposure it is broken, and each half developed with the solution to be tried.

You will recollect that you published Wothly's developer. It consists of a stock saturated solution of iron, from which 2 oz. is added to a pint of water, &c. This is the best I have ever used, and several months' use makes me say so. The full intensity is always obtained without further intensification, and the half-tones and details leave nothing to be desired. In my comparisons with gelatine developers, it is decidedly preferable, and I think it must be conceded that Wothly's own negatives were some of the finest ever done by any one. A clever man like Mr. Cooper would produce capital work with almost any materials, and I hope we shall not hastily run after novelties without very good reasons. I took some of the new developer last week down to Brighton to be tried by a very talented photographer, who produces excellent pictures, who quite agrees with me that it is no improvement.

I am glad to see the Fothergill process revived. I have long considered it the best dry process.—I am, sir, yours sincerely, Samuel Fry.

[As we before stated, our experience with Mr. Hughes's modification of the developer was very favourable. We are at present engaged in a series of comparative experiments with several forms of this developer, which we hope to state shortly. —Ed.]

Photo-Binography.

Sir,—Your correspondent "T. E. P." considers it very singular that no one has thought fit to pen a line in support of Mr. Pettitt's views concerning "binography," and wonders how any sane man can suppose the "so-called binographs" to be anything but "comparative abortions."

At the risk being considered insane by "T. E P." for differing from *his* opinion, I beg to inform him that "binography" has both supporters and admirers, but whilst the controversy is confined to the opposition of a few individuals desirous of viewing their literary compositions in print, they think it perfectly unnecessary to publish their opinions.

"T. E. P." informs us that on first seeing the binographs he supposed them to be "glass positives," and then, from their "peculiar colour," "developed prints." I should imagine that any photographer with a very ordinary amount of knowledge would not require a second look to discern the difference between the above. Does "T. E. P." understand what he has been writing about? If not, I should strongly recommend him to learn, instead of constituting himself the judge of a question only to be solved by intelligent and scientific men. I may add that I am in no way interested in binography except as a scientific and useful discovery, and remain, sir, yours obediently, Pendrill.

[The correspondence on this subject must now cease, until Professor Wheatstone has made his communication.—Ed.]

Dangers of Cyanide of Potassium.

Sir,—Seeing the letter of "E. K." on the dangers of cyanide of potassium, and your remarks thereon, in last week's Photographic News, it occurs to me that my own experience in this matter may possibly be of use to "E. K."

About seven years ago, when using cyanide of potassium for fixing, I lost the use of my left hand, suffering great pain; the pain and loss of muscular power were quite local, extending no further than the wrist. I consulted two medical gentlemen; one thought it was rheumatism, the other suspected cyanide of potassium had caused it. After several applications had been tried without any beneficial result, a friend advised washing the limb with a solution of iodine, remarking, on the doctor's opinion, "If it is rheumatism it will do no harm, and if cyanide of potassium, it will do good." I followed the advice, and in the course of a few days the muscles regained their wonted strength.

Whether iodine would be suitable or not in "E. K.'s" case is not for me to say; but seeing there are several points of similarity in his case and mine, though one as regards pain is dissimilar, I have thought it a sort of duty to write the above. If "E. K." regains the use of his hands, which I trust he will, photographers will thank him to say by what means.—I am, dear sir, your obedient servant, W. Fox.

Sir,—I have to thank you for your early notice of my letter of the 30th September, and still more for having published it in last week's edition of the News, as this may call forth other communications on the subject. I have already heard of one photographer who gave up cleaning his fingers with cyanide because he often felt his hands and arms benumbed afterwards; and I believe this to have been the cause of the evils in my own case, from the facts that I can discover no indications of mischief in myself except in my hands and arms, and that (though still very weak and crippled, as my writing shows) the hands have certainly not got worse since my suspicions led me to discontinue the use of cyanide early in September. From their appearance, probably, no person would suspect their actual condition, and I do not at all despair of their now gradually recovering to some extent. It seems certain that, if cyanide is to blame in my case, the mischief has been done by immersion of the fingers, and not by inhaling of its noxious fumes in a confined space; for I never used it at all except in a large open room.—I remain, sir, thankfully yours, E. K.

[Our correspondent will see the preceding letter of Mr. Fox. At present the local action of cyanide on the system does not appear, from all we can learn, to have received sufficient attention. We shall avail ourselves of any opportunity of learning more on the subject. See our leading article on this subject. —Ed.]

Talk in the Studio.

Direct Carbon Process.—We have received, from Matthew Firling, of Dorchester, whose interesting experiments in carbon printing we have before noticed, two examples of direct carbon printing, with very excellent half tone, gradation, and vigour, one of them being an especially fine print. Regarding them he says:—"I have for the last twelve months past been trying to find some plan by which the carbon process might be worked without re-mounting before developing or transferring to bring the print in its proper position, and I am glad to say that, after trial upon trial, I have succeeded in obtaining a perfect direct carbon printing process, and which is so simple that it can be worked with astonishing ease, and, I think, cannot help being made a commercial thing of in course of time. It is based on the use of a bichromate collodion. I have sent you two prints, but they are not quite so good as I should wish them, but I will try and send some better shortly."

Photography and Book Illustration.—We understand that Mr. A. W. Bennett is about to add to his series of "Photographic Gift-books" an edition of Scotts "Marmion," and a work by Mr. F. G. Stephens entitled "Flemish Relics, Architectural, Legendary, and Pictorial;" also two smaller works on the "Ruined Abbeys and Castles of Yorkshire," and "The Border."

Lunar Photographs.—We have received from Mr. A Brothers, of Manchester, an exceedingly fine series of photographs illustrating the various phases of the recent eclipse of the moon, and further details regarding them, which will appear in our next.

Alkaline Metals and Pyroxyline.—Some curious reactions of the alkaline metals upon gun-cotton have recently been discovered, which may possibly throw some light on the decomposition in collodion which takes place when the salts of these metals are present:—The facts have been pointed out by Mr. W. S. Scott. In some of his recent experiments he accidentally dropped a piece of potassium upon some gun-cotton lying upon his laboratory table, and was surprised to see that the gun-cotton immediately exploded. He then instituted a series of researches to determine what conditions were necessary for the explosion to take place—whether the phenomenon was the result of moisture; whether other metals would act similarly, &c. He found that, notwithstanding all his precautions to prevent friction, the gun-cotton still exploded. When sodium was employed a like result followed, though the gun-cotton had been rendered perfectly anhydrous. When an amalgum of sodium and potassium was used, no apparent result was produced. Various other metals were experimented with, but decided effects were obtained only with the metals of the alkalis. One of Mr. Scott's discoveries is the fact that when metallic arsenic is mixed with gun-cotton, a blow of the hammer is sufficient to ignite it.

Atlantic Telegraph.—Mr. Francis S. Beatty sends us a letter in which he suggests a plan of meeting the accidents by which the last Atlantic telegraph was lost. As Mr. Beatty is a very old photographer, it may interest some of our readers to learn his method, although his letter at length is scarcely suitable for our columns. He says:—"Those acquainted with the application of electricity to mechanism will understand how an open ring could be made to close and open by electrical means. If through such a ring the Atlantic Cable had been made to pass freely, and this ring attached to the end of a wire rope having two insulated copper wires enclosed therein, and passed out to the deep sea while the other end was affixed to the paying-out vessel electrical communication with the ring, the battery on board, through the medium of the insulated copper wires enclosed in the wire rope, could be instantly made. In the late disaster, the moment the cable parted, the engineer in attendance on board the *Great Eastern*, by making battery contact, could have closed the ring upon the telegraph cable, and, by winding in the wire rope to which the ring was attached, as well as the cable, the broken end could have been secured, and thereby have saved an endless expense and loss of time in endeavouring to accomplish one of the greatest undertakings ever conceived by the ever active mind of progress."

"Simila Similibus."—A comic paper says:—"We read that 'a new process of photographing on wood' has been patented. It is found to be specially adapted for all blockheads, and the members of different boards. Persons who are plain, however, object to this new style of portraiture, for fear that they might, should the wood be the least ill-grained, come out a deal plainer."

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To Correspondents.

L. P. M.—Reticulation is generally the result of excess of water in the collodion; that is, the spirits employed in its manufacture are not sufficiently highly rectified. The presence of water also generally tends to make the collodion lumpy and gelatinous. Some samples of pyroxyline tend to produce the same defects. The use of an alkaline iodizer tends to make collodion more limpid, yielding consequently a more textureless film. It is important both for microscopic photographs and for negatives for enlargement to secure a collodion giving a fine textureless film. The addition of a few drops of chloroform to each ounce of collodion, as a remedy for coarse films, was proposed many years ago. We tried it, and found no advantage from its employment; and as it did not come into use, we presume it was not found more efficient by others. The statements of the Society's Journal, in pointing out the blunders in the Journal to which you refer, were correct. We did not notice the blunders in question, as they did not appear to us likely to do much harm, as any photographer reading the summary in which they appeared will perceive that it is not written by one practically familiar with the art, but who probably states the best he knows.

A Tyro in Trouble.—Some portions of your excited plate looking transparent most probably arises from the plate being kept too long after coating, before immersion, and the film becoming partially dry; that part is less perfectly coated than the rest with iodide of silver. 2. Fog and a thin image may proceed from many causes. It may be the result of using very new collodion; it may be the fault of the developer; it may be the result of over-exposure; it may be the result of diffused light reaching the plate; or it may be the result of a bath out of order; but the description is too general to enable us to indicate which of these causes is in operation in your case. 3. If kept in bottles properly stopped, it is not important in what kind of place you keep acids, ammonia, &c.; but a cool place, without too much bright light, should be selected by preference. 4. "How many 2½ × 2 plates should a five-ounce bath excite, without requiring to be replenished?" is rather a difficult question, and would require a nice calculation of the amount of collodion employed in coating those plates and of the amount and kind of bromides and iodides such collodion contained. It very often happens with the collodion bath, that the amount of water removed by evaporation, &c., very nearly keeps the bath at the same strength throughout the time it is used. Sometimes, however, it becomes gradually impoverished, which may be observed by the plates requiring a long time to excite, by the image being weak, &c. If a bath be made of a strength of thirty grains to the ounce, and then be replenished from time to time with a forty-grain solution, it will generally keep in good working order, so far as strength goes.

Ignoramus.—We do not know the focus of the front lens of the portrait combination you name, and we have not one at hand to measure. If you have it you can easily ascertain by focussing some very distant object, and then measuring the distance from the lens to the ground glass; or the manufacturer will doubtless inform you. 2. We have not tried it for landscape, but see no reason to doubt its good working. 3. The question of focussing with a rack and pinion on the lens, or by moving the body of the camera, is very much one of convenience and habit. We prefer to focus with the body of the camera, moving that part carrying the ground glass. 4. The question as to the best proportion of bromide is one on which various opinions are held by good authorities. It is very much affected by the purpose of the collodion, the kind of pyroxyline, the kind of iodides used, &c. For dry plates, moreover, as a rule, much more is desirable than for wet plates. We employ, as a rule, for wet plates, a collodion containing from half a grain to a grain to the ounce of collodion. If we had to deal with great contrasts in which we desired to secure harmony and softness, we should use from 1½ grains to 2 grains. With 2 grains, or upwards, we should call the collodion highly bromized. Excess of bromide reduces contrast, and at times renders it difficult to secure vigour, but it aids in securing softness. We should rarely exceed 1 grain of a bromide to the ounce for portraiture, unless we had especial contrasts of colour to render; but even then full exposure and rapid development, with the proportion named, would generally answer. 5. The process of enamelling is difficult to effect upon mounted portraits; it can be done by using thin sheets of gelatine and collodion prepared, then lifted from the glass when dry, and applied to the moistened surface of the mounted print.

R. Simmons.—We have not heard anything of Mr. Moule's photogen for some time. Night portraiture is never convenient, and it can scarcely by any possibility be so good as day portraiture, but Mr. Moule's contrivance was the best at the time it was introduced. The magnesium light has, we believe, superseded it in convenience and economy. You will be able, however, to get details of price, &c., from Mr. Moule, Hackney Road, which address will, we think, find him. You may get magnesium wire of any of the photographic dealers, and lamps for burning it, either of Mr. Solomon or Mr. Hart.

A Constant Reader.—The method of producing scarlet negatives by the employment of Schlippe's salt would require too much space to repeat in this column. You will find it fully described in our number for April 13th, page 170, of the present volume.

Educator.—So far as we know, Kaulbach's illustrations to "Reynard the Fox" are not copyright in this country.

John White (Australia).—A plain collodion of pretty good body, and which dries free from opalescence when poured on a plate of glass, is best for enamelling. To secure the film readily leaving the plate, the glass should be rubbed with a solution of wax in ether before coating with collodion, so as to leave on the plate a scarcely perceptible coating of the wax. Thanks for the prints and the hints.

H. M. J.—Several articles have appeared in our pages on taking one person in two positions on one plate. You will find full information on the subject in our number for March 31st of this year.

W. Crisford.—When a nitrate bath is out of order it is always worth while to try simple remedies to restore it; if these fail it is better to reduce it at once than to waste time in perpetual doctoring. 2. Common water may be used for the floating bath, and frequently with advantage. 3. Protosulphate of iron is used in preparing the new developer. 4. We believe the protection continues for three years.

Farewell.—If the lens worked satisfactorily in your presence in the hands of the person who sold it to you, it ought to do so in yours. Possibly in the case in question the objects were so disposed as to favour the lens. To get definition all over a standing figure, you must use a lens of sufficiently long focus, and the shorter the focus in relation to the work required of the lens, the smaller the stop necessary to secure the results. 2. For enlarging negatives we prefer a transparency made in the camera.

Communications from Nelson K. Cherrill, J. Palmer, F.R.G.S., Thomas Heaviside, Quarto, Another Member of the Photographic Society, and several other Correspondents are compelled to stand over until our next.

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Photographs Registered during the Past Week.

Messrs. W. and D. Downey, 9, Eldon Square, Newcastle,
Photograph of Rothbury Church,
Photograph of Rothbury Rectory,
Photograph of Rothbury Village,
Two Photographs of Dr. Hamilton,
Photograph of Sir Roland Errington.
Mr. Wm. Plumtree, Louth,
Two Photographs of Old Houses, Louth Market Place.
Mr. W. Fox, Sandbach,
Photograph of Miss Meteyard (Silverpen).
Mr. J. Southwell, Coleshill, Highworth,
Photograph of Rev. E. Bouverie.
Mr. Worth, Darlington Street, Wolverhampton,
Photograph—Introduction to Album.
Mr. Henry Lambert, Bath,
Two Photographs of Rev. Mr. Wilkinson.
Messrs. G. and J. Hall, Westgate, Wakefield,
Photograph of Diagram concerning Wakefield Industrial Exhibition.
Mr. W. Hector, High Street, Crediton,
Photograph of Elias Ward, Esq.
Mr. Sidney Webb, Pembroke Dock,
Two Photographs of Captain Richard Aylward.
Mr. J. Roberts, Draycott, Staffordshire,
Portrait of Lord Vernon,
Portrait of the Hon. Miss Fife.
Messrs. Minshull and Hughes, Chester,
Three Portraits of Dr. Anson.
Mr. E. Cox Walker, Liverpool,
Three Portraits of Rev. Father Nugent.
Mr. W. Clarke, 22, Kennington Park Road,
Photograph of Kennington Gate and Church.

PATENT OFFICE

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 374.—*November* 3, 1865.

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EXPERIMENTS WITH THE ORGANICO-IRON DEVELOPER.—SOME CURIOUS RESULTS.

Without discussing at large the extent or nature of the advantages found in the use of the new organico-iron developer, or entering into the philosophy of the various modifications and their results, it may interest many of our readers, and give a direction to their experiments, if we record the results of a few comparative experiments we have recently made, and which form part of a more complete series we hope to make.

In trying the formula of Mr. Hughes, described some weeks ago, and the results, of which we had occasion to speak in satisfactory terms, we were struck by their similarity to those we had frequently obtained in using an improvised solution of saccharo-sulphate of iron. It will be remembered by some of our readers that we especially described this developer, and its action, in a paper read before the Glasgow Photographic Society. It required no alcohol, little acetic acid, and gave a rich brown negative which rarely required intensifying. In physical properties it very nearly resembled the solution prepared by Mr. Hughes's formula, and the results were very similar. As it has been frequently objected that no actual combination took place between the sugar, and iron, and salt, and that, therefore, no chemical action resulted from its presence in the developer, we resolved to institute some further experiments for the purpose of determining how far its physical properties were concerned in the result obtained, and how far in this respect the results of some of the modifications of the gelatine were dependent on like causes.

Our experiments were made in the studio of Mr. H. P. Robinson, who kindly undertook the manipulation, and was not informed of the nature of any of the developers, only knowing them by numbers, until he had given his opinion of the results. A nitrate bath, in good working order, very slightly acid with nitric acid, and a fresh sample of Blanchard's bromo-iodized collodion, was employed; the lens being a Dallmeyer's No. 2 B. As a standard for comparison, a newly-made twenty-grain solution of iron, with twenty minims of glacial acetic acid, was prepared, which we shall call the ordinary developer.

First Experiment.—A freshly made twenty-grain solution of iron, containing in each ounce a drachm of fine Narbonne honey, with no acid of any kind, and no alcohol, was tried on one half of a plate, the other half, which received the same exposure, &c., being developed with the ordinary developer above mentioned. That half developed with the ordinary developer gave a thin image, with a tendency to fog, and looked slightly under-exposed, detail being imperfectly marked. In that half with the honey developer the image appeared a little more slowly, coming out, however, with much vigour and detail. There was no fog whatever, the plate being remarkably clean. The finished image, without intensifying, was round, vigorous, finely modelled, and possessing the well marked detail and relief which are sometimes described by the word "plucky." The colour was deeper, and the negative of altogether better character than that with the ordinary developer. The honey solution flowed over the plate something like the gelatine developer prepared by Mr. Hughes's formula, but with less tendency to form frothy bubbles than the gelatine caused in our hands when shaken up.

Second Experiment.—All the conditions being precisely the same, we tried a sample of developer with which we had been favoured by Mr. Nelson K. Cherrill, made after the formula he described in our pages.* As we had had it in our possession about a month, we expected that it would be very inactive from keeping, the colour being like that of a brown sherry. It flowed well and developed slowly, but, to our surprise, gave a completely detailed and excessively vigorous negative, the deposit being, by reflected light, of a brown-black tone, exceedingly non-actinic. It was remarkably clean and free from fog; the only fault being excess of intensity, the continued application of the solution increasing density as rapidly as it brought out detail, so that the general result very much resembled, in many respects, that obtained with pyrogallic acid. The conclusion we drew respecting the use of this developer in the condition as to age at which we employed it, was, that where great intensity was required, as in copies of prints, &c., where difficulty was found in obtaining intensity from the newness of the collodion, the condition of the bath, &c., or where a highly bromized collodion was employed, such a developer would be invaluable; but that for purposes where excess of intensity was not desired, and other things were working well, this developer, either in a newer state or with less of the restraining preparation, would be most excellent.

Third and Fourth Experiments.—In these experiments we tried two samples of a preparation, by a modification of Mr. Cherrill's formula (see *ante*, p. 483), with which Mr. H. Cooper had favoured us, marked No. 1 and No. 2, the instructions being to add from one to two drachms to the ordinary iron developer. We added, therefore, one drachm and a half of each to two separate ounces of a twenty-grain iron solution, adding also with No. 2, according to instructions, a few minims (we added eight) of acetic acid. The exposure was in this case relatively longer than in the former experiments, a great improvement taking place in the light. The result was, unfortunately, in both cases, far from satisfactory. With very prolonged application of the solution an unwilling under-exposed image came out, very intense and black in the high lights, but without detail. The results of each were very similar, but we fancied that No. 2 was best. Our conclusion was that the amount of restraining solution employed was greatly in excess of what was required under the circumstances in which we worked. It is also to be noted, as probably arising from the same cause, that a stain was produced in each instance, at the spot at which the developer first touched the plate, the free silver being driven from the place, and a more transparent spot than the rest being the result. Mr. Blanchard mentioned to us that the same result had followed the use of the same preparation used in the same proportions in his hands. As the pictures produced by Mr. Cooper himself were almost faultless, it is legitimate to assume that the state of the weather and other circumstances had, in our hands, materially modified the results.

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* See p. 466.

Fifth Experiment.—In the first experiment it became tolerably clear that whilst the mechanical properties conferred an advantage in developing, there was exercised an undoubted chemical effect by the presence of honey in the developer. Apart from other good qualities, the solution containing it did not fog during prolonged development, whilst that possessing acetic acid did fog. The remaining experiments, however, confirm this view in a degree we were not prepared for. Half a drachm of golden syrup was added to an ounce of the twenty-grain iron solution without acid, and applied to a plate treated in like manner to those described. At first no trace of an image appeared, and after prolonged application a slight appearance of the high-lights only appeared.

Sixth Experiment.—Half a drachm of glycerine was added to an ounce of the twenty-grain iron solution without acid. A plate, treated as before, developed rapidly, and gave a very soft detailed image of good quality, but grey in colour, and without intensity. On prolonged application there was a slight tendency to fog.

Seventh Experiment.—Half a drachm of common treacle was added to an ounce of the twenty-grain iron solution without acid, and a plate, treated as before, developed with it. No trace of an image appeared after prolonged application.

Eighth Experiment.—One drachm of the last solution (containing therefore 3½ minims of treacle) was added to an ounce of the twenty-grain iron solution without acid, and a plate treated as before. Slowly, a black intense under-exposed image appeared, showing that three minims and a half of treacle restrained reduction considerably more than twenty minims of glacial acetic acid.

Further experiment with the honey solution prepossessed Mr. Robinson very much in its favour. A portion of the developer solution we prepared with Mr. Hughes's formula was tried when a month old, the colour having become a deep brown. It developed slowly, giving a hard dense picture, possessing by reflected light a singularly fine silvery whiteness.

Many reflections will be suggested by these experiments, especially by the unexpected results with treacle, but we do not enter into them now. We present the experiments as suggestive, and shall be glad to learn the experiences of others in the same direction. We shall probably return to the subject when we have made further experiment.

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MR. BROTHER'S PHOTOGRAPHS OF THE LUNAR ECLIPSE.

We have been favoured by Mr. A. Brothers, of Manchester, with a series of prints from his photographs of the moon during the eclipse of October 4th. The series, eighteen in number, about two inches in diameter, is admirably perfect and uniform in excellence throughout, forming as fine an illustration of astronomical photography as we have ever had the pleasure of witnessing. Mr. Brothers states that there was considerable atmospheric disturbance, which materially interfered with the perfect rendering of detail. The pictures before us, however, require no apology, as, in most respects, they equal or excel much that we have seen produced by persons who have devoted much more time to astronomical photography than Mr. Brothers has yet done. We hope that he will have further opportunity of devoting his attention to a branch of the art he has so successfully commenced.

From the details with which we are furnished we learn that, "commencing at 8.45, when the moon was nearly full, the negatives, twenty in number, were taken at intervals of about twelve minutes until 12.45, and they show the progress of the eclipse throughout. The effect of the penumbral shadow of the earth is distinctly visible on the negative taken at 9.15, and also on the one taken at 12.32. An attempt was made during the middle of the eclipse to obtain the photographic image of the entire surface of the moon; but it was found that the portion covered by the earth's shadow had no effect on the plate after an exposure of fifteen seconds, although distinctly visible in the telescope. It was noticed that the southern limb of the moon showed the copper-coloured tint often seen during total lunar eclipses, and to this cause may be attributed the non-actinic effect on the sensitized plate. An exposure of about one or two tenths of a second gave the fully illuminated surface of the moon perfectly, but the parts covered by the penumbra were not defined, while an exposure of three seconds gave the outline of the earth's shadow with great distinctness, and an exposure of two seconds brought out some of the detail within the penumbra. Some of the negatives were obtained almost instantaneously.

"The telescope with which these pictures of the moon were taken is an equatorial of five inches aperture and six feet focal length, driven by clockwork. This telescope gives the image of the moon about $\frac{11}{16}$ths of an inch in diameter, but by using a Barlow's lens this size is increased to $1\frac{1}{4}$ inches, and with this addition the eighteenth negative of the series was obtained in two seconds."

From a tabular statement of the hour and length of exposure of each picture, we learn that the longest exposure was fifteen seconds, and the shortest instantaneous, the average having been from one to two seconds.

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OBSERVATIONS ON SOME NEW COMPOUNDS OF PYROXYLINE.

BY JOHN SPILLER, F. C. S.

In the *Comptes Rendus* of the Academy of Sciences, under date May 30th, 1864, appeared an interesting communication from M. Blondeau,[*] which was devoted to the description of some new ammoniated products of pyroxyline upon the examination of which, at about the same time, I happened also to be engaged in connexion with the investigation of gun-cotton, undertaken by Mr. Abel. The substances in question are formed whenever gun-cotton, or the soluble variety of pyroxyline, is exposed to the vapour of ammonia, and the chemical action facilitated by maintaining a slightly elevated degree of temperature. The operation is best performed on a small scale, by treating some forty or fifty grains of explosive cotton in a long-necked flask with aqueous ammonia (sp. gr. 880), added by successive portions of eight or ten drops, and the flask, fitted with a very loose cork, immersed for an hour or two in a water bath kept at the temperature of 100° to 120° Fahr. The colour of the gun-cotton speedily changes to a light yellow, which gradually darkens to a russet brown, and its physical aspect undergoes a modification, to the extent of becoming a soft, friable mass, which still presents a fibrous appearance. By this treatment the explosive properties remain almost, if not quite, unimpaired; and it is worthy of mention that the production of this substance in large quantities is attended with risk, and that explosions have occurred in the course of my experiments whenever I increased the amount of material operated upon, or endeavoured to employ a somewhat higher temperature, in order to expedite the reaction.

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[*] See *ante*, p. 499.

M. Blondeau claims for his compound advantages on the score of greater permanence and superior explosive power, when compared with the varieties of gun-cotton which have lately been made the subject of experiment, with a view to their use in warfare. The author further states that the absorption of ammonia by the gun-cotton is accompanied by an increase in weight, notwithstanding the elimination of a certain amount of oxygen in the form of water. There are, he believes, several stages in the reaction, and he recognises particularly two bodies having the following formulæ:—

Nitro-cellulo-triamide $C_{12}\,H_{10}\,O_{10}\,(NO_4)_3,\,(NH_2)_3.$
Nitro-cellulo-pentamide $C_{24}\,H_{20}\,O_{20}\,(NO_4)_5,\,(NH_2)_5.$

It is not necessary for the present purpose to follow the author through the remainder of a series of interesting bodies derived from the first of these by the action of lead and potassium salts, or of sulphuretted hydrogen; but we cannot omit to refer to a statement which is embodied in a more recent communication to the French Academy, and is printed in the *Comptes Rendus* of the 28th August last. M. Blondeau remarks that he has succeeded in converting the ammoniated gun-cotton (the *pentamide* already referred to) into a kind of saline combination by treatment with hydrochloric acid; and, furthermore, that the same product may be obtained by boiling, for half an hour, gun-cotton in a tolerably strong solution of sal-ammoniac, then washing in a plentiful supply of water, and drying in the sun. The formula of the compound thus formed is stated to be

$$C_{24}\,H_{20}\,O_{20}\,(NO_4)_5,\,(NH_2)_5,\,(HCl)_5.$$

The substance is said to be permanent, and to resist decomposition at all temperatures not exceeding that of boiling water; it is equally explosive with, but gives off during combustion, certain products in addition to those furnished by ordinary gun-cotton, particularly cyanogen and the vapours of chloride of ammonium.

Conceiving this substance to be well-fitted for the production of a collodion which, by the addition of nitrate of silver, would become at once available for the collodio-chloride process, I attempted its preparation in the hope that it might prove to be soluble in ether and alcohol. Failing, however, in the first attempt, I made repeated experiments upon several different varieties of gun-cotton (the exact quality of which the author omitted to specify), following to the letter the instructions given, but without being able in any instance to fix an appreciable quantity either of chlorine, or of the elements of amidogen. It is needless to observe that a mode of formation founded upon the successive production of the ammoniated and of the chlorinated compounds would be too tedious to permit its use in the practical direction already indicated.

Inasmuch as I could not perceive any alteration in the properties of the gun-cotton which had been boiled with solution of sal-ammoniac, and failing in obtaining analytical proof of the existence of chlorine and amidogen, I proceeded next to compare the weight of the substances before and after treatment. In operating upon weighed portions of the highly-explosive tri-nitro-cellulose, and likewise of the inferior nitro-compound usually employed in the manufacture of collodion, I could not discover the slightest increase, nor indeed any alteration, in weight as the result of such treatment. The samples were, of course, thoroughly washed in many changes of distilled water (until nitrate of silver failed to show any indication of alkaline chloride yet remaining), and they were allowed to dry by free exposure to air. According to M. Blondeau's formulæ, which exhibit a constitution embracing a greater number of hydrogen and oxygen atoms than usually assigned by English chemists, the chlorinated product should weigh at least one-third more than the gun-cotton from which it is prepared, as will appear by the following comparison:—

Pyroxyline.		Chlorinated product.	
C_{24} … …	144	C_{24} … …	144
H_{20} … …	20	H_{20} … …	20
O_{20} … …	160	O_{20} … …	160
$5\,NO_5$ …	270	$5\,NO_4$ …	230
		$5\,NH_2$ …	80
	594	$5\,HCl$… …	182·5
			816·5

With respect to the yellow combinations obtained by the action of ammonia upon gun-cotton of various kinds, I find that they are all distinguished by their ready solubility in wood-spirit, and in mixtures of ether and alcohol, but that alcohol alone is for them but an indifferent solvent. The solutions obtained do not offer any promise of being successfully employed as photographic collodion; firstly, on account of their objectionable colour; and, secondly, by reason of the opaque and pulverulent qualities of the film left on evaporation.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Close of the North London Exhibition — Dry Processes — The Dublin Awards — Enlargements — The New Developer—Mr. Woodbury's Process—Cyanide—The Societies.

The North London Exhibition is at length closed, after a struggling existence of two months, and with, I hear, a loss to the guarantors of between one and two thousand pounds. This is a sad and undeserved ending, and is a loss not only to those who nobly came forward to guarantee any deficit that might occur, but to the district, which, of course, must now give up all expectation, for a time at least, of establishing the museum, the funds for which it was hoped would obtain a substantial nucleus from the proceeds of this exhibition. It must be a satisfaction to photographers to feel that their department was so complete that if anything could have saved the fortunes of the exhibition it would have been the display of their works.

Photographers are continually complaining that they have no good dry processes. The collodio-albumen, they say—but with which statement I do not agree—is too troublesome, as if trouble was of the least consequence when a perfect result was in view. The tannin process has been so belauded by some of its friends and modifiers that many photographers have been induced to try it; and have been so continually told that their want of success has been the result of their own want of skill, or the imperfection of their materials, that they have tried and tried again with that patience which happily characterises many of the votaries of our art. The apparent simplicity constitutes a charm, and they believed it was their own fault if they did not secure satisfactory results from what turned out so frequently an unsatisfactory process.

Mr. Sayce's collodio-bromide, the youngest and one of the most promising of the dry processes, was brought forward late in the year, and has not had a chance yet, but I have great hope in its becoming popular in the spring. Nothing can exceed its simplicity, and few processes can equal it in results. The Fothergill process has been a favourite with many, but the difficulty of getting exact results, caused principally by a peculiarity in the manipulation, has been a serious drawback to its general use. The difficulty has been to obtain a definite amount of silver in the film. Experiments to secure this desirable end have been instituted by several experienced photographers—of whom the most successful was Mr. Bartholomew—with varying success. Mr. Acland, following in Mr. Bartholomew's footsteps, has lately succeeded in constructing definite formulæ, which he has published in the News, and which appear to remove all the difficulties and uncertainties of the process, for which he deserves the thanks of the photographic community, especially those who have been breaking their hearts over processes so complicated that the production of one passable picture out of a dozen plates has been looked upon as a successful day's work. The conduct of Mr. Acland in giving ample credit to Mr. Bartholomew as the original proposer of the method he has systematized, is worthy of all commendation, and affords an example well worthy imitating by some who, as soon as a novelty of any kind is published, at once issue a slight modification and call it their "process."

Early in the month the list of awards and the reports of the jurors of the Dublin International Exhibition were announced. The report of "Class F.—Fine Art (Photography)," as the department devoted to our art is honourably styled, is a long, well written, and appreciative review of the salient features of the Exhibition, with which, with one or two exceptions, I entirely concur. My chief exception is to the injudicious compliments which are paid to Mrs. Cameron's well known out-of-focus pictures, and which do not read as if they had originally formed part of the report; and it is to be noted that the jurors did not back their opinion by the award of a medal, "Honourable Mention" being considered sufficient. I have very little hope of pictures like these, and should be sorry to see the infection spread. In most other respects the report is capital, and contains, besides many practical hints, much encouragement to beginners in photography in sentences which are quite epigrammatic, some of which I should like to extract, had not the report and a leader thereon already appeared in the News. And this reminds me that the report has only been published by the News and the *Journal of the Photographic Society*. What *could* have been the reason of the other journals foregoing such a capital bit of copy, and depriving their readers of a report which will be required for reference for years?

The awards appear to have been very carefully and equitably bestowed, but there is a little descrepancy in one case between the report and the list of awards, which must have been an oversight. The report speaks very favourably of Mr. Brothers' pictures and experiments by magnesium light, but neither a medal nor "Honourable Mention" is awarded. Is it too late to remedy a manifest oversight? Another curious omission is that of the United Association of Photography; although they contributed largely to the Exhibition, they received no award.

It is generally considered that enlargements, however good, are not good enough in their original state, but that it is necessary to have them finished by hand before they can be offered to the public as true likenesses and perfect works. And here comes the difficulty, to find artists, primarily, capable of doing good work, and, secondly, at a price that will enable photographers to supply their customers at a reasonable rate. I have never yet seen the first want supplied, without any consideration of the second. I am continually being asked the question—Can you recommend me to an artist who can finish enlargements in black and white chalk decently? and I am always compelled to answer in the negative. There is a fortune for any man with moderate abilities who will devote himself to this kind of work. It would be a pity if the demand for enlargements should die out because photographers cannot find artists with the very moderate amount of knowledge of drawing necessary for finishing a picture, the principal difficulties of which, such as drawing and light and shade, have been overcome for them by the photographer.

Besides the one suggested by Mr. Hughes two months ago, there have been several modifications of Mr. Carey Lea's new developer suggested, all having for their object the simplification of its manufacture, and the obviating of the necessity of employing iron filings, which are difficult to obtain free from contamination, and are inconvenient to use. The formula suggested by Mr. Nelson Cherrill, the philosophy of which he has so well reasoned out, is certainly the most scientific as well as one of the best. Mr. Cooper, taking Mr. Cherrill's formula as a foundation, has made numerous experiments, and stated another mode of making the developer. He has also illustrated the practical advantage to be derived from its use by the best of all proofs, a series of magnificent prints from negatives obtained with it.

Mr. Woodbury is making rapid strides towards perfection in his process, which I cannot help regarding with increased wonder whenever I see a fresh production from his intaglio plates. Some late specimens are so absolutely like silver prints, that it requires close examination to discover the difference. And these the inventor regards as far from the perfection which he feels confident of attaining. When Mr. Woodbury is sufficiently satisfied with his results to bring his process prominently forward, book illustration by photography will become as common as it now is with wood-cuts; and I understand that he has promised that the readers of the News shall be favoured with the first published illustration.

When will cyanide be banished from the photographer's laboratory? Every week we hear of somebody being either maimed, paralysed, or killed by this deadly, and, to a photographer, totally unnecessary poison. Several letters have lately appeared in the News, describing its dreadful effects. Many people are still so ignorant of its action that they do not know that it is a poison. Only yesterday a gentleman, who is commencing photography, told me that a quantity of it was sold to him by a chemist without any caution, and that, finding a lump too large to go into his bottle, he put it between his teeth and bit it through! Of course nothing but very prompt measures saved his life. One of its peculiarities is, that you may use it for cleaning the hands for years with impunity, and that, after a time, finding the blood in some special state, it commences its attack, and the victim will not believe that the cyanide is the cause of the pain he feels. The intensity of the pain experienced by those who suffer from this poison is, perhaps, the most awful that could be imagined.

The opening meeting of the London Society is announced for the 14th of November, when a paper will be read by Mr. Mayall on the Construction of Glass Houses. A paper is also promised by Mr. Hughes, time permitting, on his Simplified Method of Preparing the New Developer.

The South London Association commenced its session with an account by Mr. H. Cooper, of his experience with the new organico-iron developer, and with the inspection of some capital illustrations of its working, which produced a long and interesting discussion. The South London Society commenced without a paper, but the evening was made interesting by the introduction of several articles of interest to photography, and by the discussions thereon. Mr. J. T. Taylor produced a bottle of Eschwege's preparation of wood naptha, and exhibited some negatives and transparencies obtained with collodion prepared with this spirit instead of ether. Mr. Taylor was of opinion that collodion, prepared in this manner, was in no way inferior to that in general use; but Mr. Blanchard and others, experienced in the manufacture of collodion, differed from this opinion; the vapour was also stated to have a bad effect on the eyes. The use of wood naptha for making collodion is old, although the manner in which the subject has been re-introduced has misled some into fancying that it is a new discovery. Mr. Howard exhibited a number of exquisite landscapes to illustrate the admirable working of Dallmeyer's new wide angle lens, and its great superiority over a view lens of the usual construction by Ross, he had in use at the same time. Mr Howard, although what is usually called a "dry plate man," shows in these pictures that he is equally perfect in the wet process. Other members exhibited prints, a Simpsontype by Mr. Fitch being especially beautiful. Mr. A. H. Wall exhibited some enlargements coloured in oil by himself, of which he modestly said (to quote a contemporary). "middle-class people would now be able to place on their walls large portraits which not many years ago would have been thought fitting and creditable decorations for the walls of a palace!"

Very little of interest has occurred in the provinces during the month. A resolution was passed by the Glasgow Association to the following effect: "That photographic assistants be admitted to the ordinary meetings of the Association on paying a subscription of four shillings per annum; but such members will not be entitled to vote on the affairs of the Society." I should recommend assistants to pay their full subscription, like men; it will amount, I believe, to about two-pence halfpenny per week. They will feel more self respect if they possess and exercise all the privileges of membership of right, instead of possessing part of them on terms which will manifestly place them in an inferior position.

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MISCELLANEOUS PHOTOGRAPHIC HINTS.

Taking Reversed Negatives.

BY M. CAREY LEA.

In some forms of carbon prints it is very desirable to have the negative reversed in order that the prints may be right, without subsequently transferring. This seems to be the case with both of the two most promising carbon processes of the day—Swan's and Pouncy's—and, from the very nature of the carbon process, will be very apt to be the case also with more or less of the carbon processes which may hereafter be devised. Various contrivances for the purpose have been proposed. The following arrangement is one which I have had in use for some time. It was planned by myself, and improved upon, in the execution, by Mr. Peace, who made the camera, and whose aptitude for carrying out and working out all new ideas is well known to the photographers of this city.

Instead of a single spring in the centre of the door of the slide, two very long ones are arranged, one at each extreme end of the door, so placed that the extremity of the spring touches the plate only in the part corresponding with the glass corners. The sensitized plate may then be laid in, in a position the reverse of that usually given it—that is to say, with the sensitive film on the side furthest from the lens; and, when the door is closed, the plate is held firmly in its place. The collodion is only disturbed in the extreme corners. It is advisable to protect the extremity of the springs with varnish to avoid a reduction of the silver. In fact, if I were having it made over again, I should probably employ wooden springs, or whalebone.

Of course, this alteration in the position of the sensitive film requires a corresponding change with respect to the focussing arrangements. The focussing slide should have no rabbet in front of the focussing glass; but this should be kept in its place with two springs in the manner which I once before described. When it is intended to focus for a reverse negative, the focussing glass must be turned round so that its semi-opaque side may be furthest from the line. It seems scarcely necessary to say that the glass on which the negative is to be taken must correspond in thickness with that on which the focus is taken.

Abnormal Reflections.—Since the remarks which I published on the influence of abnormal reflections upon the negative, I have been much impressed with the necessity of avoiding light from every possible source which may strike the sensitive film. On carefully inspecting my dark slide, I found that the door which, when the picture is being taken, is, of course, immediately behind the plate, was very highly varnished. Now, it is true that the wood (cherry) was of a highly non-actinic colour. But it seems often to be forgotten in such matters that when we apply a coat of varnish we create a new surface, which is perfectly distinct from the wood surface beneath. No matter how non-actinic the colour of the wood may be, the varnish is capable of reflecting *white light* abundantly. And as we now know beyond dispute that a bromo-iodised film will transmit a considerable quantity of effective rays, it is evidently most improper to permit the existence of any reflecting surface whatever behind it. I have, therefore, thoroughly deadened mine, using for this purpose gelatine and lampblack, though probably any varnish mixed up with so much lampblack that it will dry dead would be better. This task should, however, not be left to the operator, but, in future, no camera ought to leave the maker's hands until every portion of the interior surface has been brought to a dead black.

Arrangement of the dark room.—I should scarcely think it worth while to advert here to so trite a subject as the dark room, were it not for one or two considerations that seem to justify it. First, the recklessness with which photographers, both amateur and professional, injure their health by unnecessary exposure to fumes; and, secondly, I wish to refer to some remarks by Dr. Von Monckhoven on the admission of light.

My chemical laboratory is arranged with methods of ventilation so thorough that I am enabled to use it as a dark room. If, then, all those chemical emanations which would interfere so much with the delicate operations of sensitizing and developing can be effectually dispersed, it would be strange indeed if those rooms which are appropriated exclusively to photographic work could not be kept sufficiently free from collodion, and other fumes, as to avoid prejudice to the health of the operators. Yet this is not done, and photographers destroy their health for want of a few simple precautions to save it.

At one side or corner of my laboratory is a stone table, 12 feet by 3 feet 9 inches, supported on masonry. The top of the table is completely enclosed with glass; there are nine glass doors in front, of various sizes and shapes. The top is of glass, standing about 10 feet above the floor, and in the end another large pane of glass is let in. Inside of the compartment are a large sand bath, 3 feet 6 inches square, a number of slate shelves, burners, and lenses of all sorts, and, finally, an iron tube, about 2 inches internal diameter, communicates with the exterior air, and introduces a constant circulation of air, even when all the doors are shut. A large opening at the top of this chamber communicates with a well drawing flue. The completeness of this arrangement will be better appreciated when I say that I have had this entire chamber filled with dense opaque red fumes of hyponitric acid, without the slightest trace of beams perceptible in the room. In a very little time the whole passes away without it being necessary to open one of the doors, or pay any attention to it. The arrangement employed for photography is the following:—A special door opens to the height of the operator's forehead as he sits, and, having about 3 feet in width while sitting outside, he performs all his operations inside by the sight of a gas burner, screened with a pane of yellow glass. For this purpose, a box, about 15 inches square by 6 or 8 deep, is selected, and all the bottom sawed out except a border of about an inch. A square of deep yellow glass is set in and confined by brads. The box is turned up on its edge, most of the upper side is cut away, and a gas burner, on a stand with a flexible tube, is set up behind it. This lantern is easily made, and most convenient. It lights up everything as brightly as could be wished, and, if the glass has been well selected, the plates, after coming out of the bath, may be left to drain as long as the operator pleases.

I have given a pretty full explanation of this glass closet, not as supposing that such would be necessary for any one who simply pursues photography alone; but for any one who desires to combine photography with extended chemical researches, I do not think anything better could be devised. And I have the strongest conviction that such an arrangement, on a much smaller scale, would be very valuable for any photographer, amateur or professional. A portion of the room partitioned off, with a single door or sash, space inside for the baths, lantern, and for collodionizing the plate—this is all that is necessary; and many a photographer's days would be lengthened if he would take the trouble to adopt this idea. But it must on no account be forgotten that unless such a closet is well ventilated, it is good for nothing. Unless the fumes are carried off, they cannot but diffuse themselves into the room. To give an idea of the thorough success which I have found attend the arrangement, I may mention that, even after collodionizing a considerable number of plates, there is no smell of collodion perceptible in the laboratory even to the nose of a person coming in from the fresh air. A clever professional photographer, who admitted himself to have greatly suffered from the influence of collodion, and to whom I recommended this method of protection some years ago, and when I had not tried it myself, objected that the necessary ventilation would cause currents of air sufficient to make the collodion dry unequally, and thus spoil the plates. But I have not found it so at all.

Illumination of the Dark Room.—On this point there exists great diversity of opinion, and there is a disposition on the part of some photographers of established reputation to advise to diminish the light of the dark room to the lowest practicable point. This I regard as not only very unnecessary and inconvenient, but highly mischievous. The contrast to the eyes from the light of the room in which the camera is placed with the darkness of such an operating room injures the eyes; the operator is obliged to strain his eyesight to find his materials, and to observe the progress of development. I say, on the contrary, use as strong a light as you find consistent with perfect avoidance of fog. I keep my own laboratory light enough to find anything I may want about the room and light enough to read without any difficulty. I have already described how the plates are sensitized with the aid of a yellow lantern. The development is effected near to a very large window, about 4 by 9 feet. The four panes of this window are protected by pasting over them sheets of thick envelope paper. The window is further protected by a green Venetian blind. In cloudy weather the blind is raised; but, even in the brightest days, with the sun falling directly on the window, the light can always be regulated with the utmost case. I have never had any fogging that could be ascribed to excess of light, and only in very rare cases, fogging of any sort.

Use of Chromate of Potash and Ammonia.—I have recently recommended the substitution of this salt for the bichromate of potash in carbon processes. My results were given while still incomplete; because I found that another chemist, M. Emile Kopp, of Paris, had been working in the same direction. When I wrote the article referred to, I mentioned that paper sensitized with the above salt had remained good as long as I had the opportunity of examining it. Since then I have had an opportunity of verifying its keeping properties to a greater extent than before. Some prepared paper, now *fourty-four days old*, I find still good. When it is recollected that paper similarly prepared with bichromate will never keep beyond a few days, and often spoils in a few hours, the immense advantage here indicated cannot but be appreciated. The paper was simply placed in a tin box, not otherwise protected.

Iodizing Negatives.—When negatives are to be strengthened with iodine, either as a final operation, or as a first step to a treatment with Schlippe's salt, or with alkaline sulphide, it is much more satisfactory and expeditious to use the iodine in alcoholic solution. But here a difficulty takes place:—If, in pouring on the iodine solution, the little pool stops in its spreading for a moment, a well marked line is formed. This line is not so important if the action of the iodine is to be carried to the yellow stage, yet even then it may spoil the plate. But if it be intended to iodize the plate only to the blue-black stage, the line does not ever disappear, and ruins the negative. In such a case, the only way is to continue the action of the iodine until the plate is uniformly yellow, when the line sometimes disappears.

To cover the plate quickly and uniformly with the tincture of iodine, and avoid these lines, the best plan is to first moisten the plate with common alcohol, and pour the excess off. On applying the tincture of iodine to the plate still wet with alcohol, the tincture spreads rapidly and smoothly over the whole surface.

A fine grain solution of iodine does very well, but one of ten or fifteen grains ss not too strong, and does the work more quickly.

Another observation is not without interest. The action of the iodine should either be stopped at the deep violet black stage, or else be continued till the plate is thoroughly yellow, and the action of the iodine is complete on every part of the plate. If the operation is stopped at any intermediate point, it tends to spottiness and irregularity.

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COLLODION AND THE NEW ORGANIC IRON DEVELOPER.

BY NELSON K. CHERRILL.

About three weeks ago I made some trials with the new developer, using a collodion containing a much larger proportion of iodide than usual in bromo-iodized collodion. Finding that more success attended the experiment than was at first looked for, I have been induced to make up a collodion on purpose for this form of developer, the formula for which I now give you. I find that it is more sensitive than most of the collodion in the market, and it will give a much softer image in my hands than any of them. An addition of formic acid to the developer in the case of interiors and dark foliage, or very rapid work, will be found to work well with this collodion, or with ordinary bromo-iodized to which about half its bulk of plain iodized collodion has been added soluble cotton.

Mix :—Nitric acid, sp. gr. 1·430, 11 drachms.
Sulphuric acid, sp. gr. 1·846, 10·2 drachms.
Water, 0·7 drachms.

When at the temperature of 130° F., immerse 50 grains of the best cotton wool, leave it in for ten minutes, during which time the acids must not fall below 120°, nor rise above 140°. When removed from the acids the cotton must be washed with the usual precautions, and dried with care before the fire; when quite dry, it may be made up into collodion by the following formula:—

Ether, pure rectified - - - -	1 oz.
Alcohol, absolute - - - -	2 ozs.
Cotton - - - - - -	18 grains.
Iodide cadmium - - - -	6 ,,
,, ammonium - - - -	7½ ,,
Bromide cadmium - - - -	3 ,,

To make this collodion rather more permeable at first, I added one drop of water to the above quantity. It gives a very creamy film in the bath, and with the new developer will be found to give the required intensity on the first application of the developer. It will be seen that the formula above is derived from two well-known sources, the formula for the pyroxyline being found in Hardwich's "Photographic Chemistry," and that for the collodion in the Year Book of Photography.

The bath solution should be slightly acid with nitric acid, as usually recommended.

The developer I see no reason to change, except that I think a slight reduction might be made in the quantity of acetic acid added. I find that the sulphuric acid may be kept for any length of time mixed with the gelatine, the proportion of sulphuric acid to two drachms of gelatine is best, according to my experience, as given before, namely, acid, 1 ounce; gelatine, 2 drachms; and I believe that this proportion does *not* act upon the whole of the gelatine, though I have now good reason to think that the gelatine and sulphuric acid *need not* be mixed in the proportion of their combining numbers in order to decompose all the gelatine. In my last letter the equivalent of gelatine should have been given 696. The discrepancies which exist between the authorities on the subject of the formula for gelatine render any calculations of its decompositions, &c., at the best very uncertain When formic acid is to be added to the developer, from 5 to 15 drops may be mixed with 1 ounce of the solution, containing 10 or 15 grains of iron, and 1 minim of acetic acid to each grain. The acetic I use is the common, not the glacial. It is necessary to remember this, as, if the glacial be used, about half the quantity will suffice; for ordinary work, with the developer of the same strength, about three-quarters minim of the acetic acid may be used to each grain. I find that cyanide has much more solvent effect on the image produced by this than upon that produced by the ordinary developer. I hope to institute a series of comparative experiments on this developer as soon as the weather clears up a little, the results of which shall be faithfully communicated to you.

As addenda to the above, the publication of which has been accidently delayed, I may add

1st. That the failure of some persons with this developer, which has hitherto seemed somewhat mysterious, may be accounted for, in part at least, by the fact that some iron solution (the quantity not a matter of importance) should be added to the solution of glycocine before neutralization. I am at a loss to account for this, but have proved it by a series of experiments. An exceedingly small proportion of iron solution is enough to effect a complete change in the whole solution.

2nd. A preliminary experiment made with a dilution of "gelatinous starch," or "amidin," in the place of gelatine or glycocine, promises to be successful. It gives the mechanical properties of gelatine, and does not seem to alter the *chemical effect* of the developer.

I may be permitted to add here without entering into any controversy with Mr. Cooper—a course which could not add practical value to anything I have to communicate—that it appears to me that the explanations in his last of his mode of preparing the gelatino-iron developer are somewhat inconsequent; and that in modifying my method he has not secured any advantage either in the operation or the results.

Belmont Lodge, Lee, S.E.

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THE GELATINO-IRON DEVELOPER.

BY EDWARD DUNMORE.

MUCH has been said already, and much more remains to be said, of this recently introduced developing combination. It is only by information gathered little by little from various sources that we shall be able to arrive at a true knowledge of its merits and imperfections.

I can, for my own part, bear testimony in its favour, having tried it under a variety of conditions both of light and heat, and with short and long exposures, of sun-lit landscape, and badly lit interiors. Never, in any instance, was re-intensifying required, nor did the shadows lack of detail, or the lights become chalky.

The simple fact that no re-intensification is required is very much in its favour. as it saves a world of trouble and much dirt, to say nothing of the time and chance of accidents saved by lessening the number of processes the negative has to undergo. In a series of twenty-four 12×10 pictures, I did not have one miscarriage on account of the developer. Having used the last of the stock I took with me, I was necessitated to fall back on the old form of iron, spirit, and acid, when the great superiority of the gelatine became apparent. The form I used for the gelatine developer was one with ammonia, sulphate of iron, gelatine, acetic acid and water, which I kept in a concentrated state, and diluted with water just before using.

A fault to be guarded against is, when poured on and off the plate, bubbles are apt to form of great tenacity, which, if unnoticed, cause marks of unequal development, however dilute the solution may be; unless the developing room be well lit, these are easily overlooked, and make otherwise satisfactory negatives come to grief; the cause known, however, the remedy is readily applied.

Another precaution to be taken, is to keep it well filtered, for by standing some time a thread-like deposit is formed, which, if poured on to the negative, sticks there with a tenacity scarcely in one's philosophy to conceive, unless experience has taught. You may wash and swill the plate vehemently; there it is, and there it is likely to remain, unless you remove the film with it, which in some cases is, perhaps, a decided advantage; but unless such energetic treatment is required, a stain is formed probably in the most delicate or conspicuous part of the picture, on the same principle that anything striking one's face is sure to get in the eye. Precaution, however, is a panacea for these evils, and the verdict my practice gives is decidedly in favour of the gelatino-iron developer.

81, *Malden Road.*

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, November 1st, 1865.

THE readers of the PHOTOGRAPHIC NEWS cannot have forgotten the name of M. Martens, a veteran and master of French photography, and one of the artists who, in 1851, obtained the Grand Medal at the London Exhibition. They will perhaps remember too, that from the very origin of Daguerreotype, M. Martens made essays towards the obtaining of panoramic pictures. In December, 1856, he presented to the Academy of Sciences images of this kind obtained by means of an apparatus of his own invention—not upon silver, but upon glass. After several years absorbed in important labours, M. Martens has resumed this interesting study, and we have just seen some very remarkable panoramas of Paris, executed with the apparatus in question, which has undergone further improvements.

In order that the flat glass may give the same result as the curved glass, it is necessary that it should follow the objective in its movement, keeping in front of it, and at a uniform distance, in order to avoid all distortion of the objects reproduced. These conditions have been fulfilled in the following manner: instead of the objective alone, the whole camera turns on a pivot fixed on a board in the axis of the objective. There are two rollers to facilitate this movement, which is effected by means of a mechanism or by the hand, according as the different portions of the landscape require a longer or shorter exposure in consequence of the various degrees of light. The inner side of the camera, which is opposite to the objective, has grooves at the top and the bottom. The chassis containing the glass is placed in a sort of movable cradle to allow of its turning round the pivot. It is maintained in the grooves by two special rollers fixed to the lower part of the cradle, and a third placed on the top. Placed on one side (the right, for instance) of the groove, which has twice the width of the cradle, the camera, in turning (to the right), makes it advance in the opposite direction, so that the glass successively presents all portions of its surface to the narrow opening, giving passage to the light transmitted by the objective.

The very simple mechanism of this apparatus permits the operator to work rapidly, and to obtain images perfectly accurate in their lines.

On Monday M. Chevreuil presented to the Academy of Sciences a note, by M. Niepce, on the obtaining of black shades in heliochromic processes. This may be done by three or four processes. By the first, which offers most interest, a pure black is obtained, either by contact or in the dark room. In the second, a slightly indicated black is obtained, and this the author calls *black by induction.* In the third, a scarcely indicated black is submitted to the influence of a diffused light, and the result is called by M. Niepce *black by alteration.* By the fourth process you obtain a dark tint, approaching black, by causing two complementary colours to act successively upon the layer. Blue and orange give a dark grey. It is nearly the same with green and red. Yellow and violet do not produce the same effect.

To obtain pure blacks in the dark room, or by contact, a very alkaline chloride of silver must be formed. Certain limits, however, must not be exceeded, otherwise you will obtain nothing but colourless blacks and whites, and so will fall back into ordinary photography; with this difference, that the picture obtained will be positive instead of negative.

M. Niepce will shortly describe the new preparation of the silver plate, and will show stereoscopic pictures, on which may be seen not only all the colours with blacks and whites, but also the lustre of metals and the scintillation of precious stones. These images, which we have seen, have a really extraordinary aspect.

Ernest Lacan.

M. CAMARSAC'S ENAMEL PROCESS.

Sir,—The last number of the Photographic News contains a communication on M. Poitevin's carbon and enamel process, and in this the author, Dr. John Anthony, draws a contrast between the liberality and courtesy with which M. Poitevin has made known all the details of his process, and the *reticence* of M. De Camarsac.

As the representative and friend of Lafon de Camarsac, will you allow me to justify him in a few words from the kind of blame thus cast upon him, without incriminating the merit and disinterestedness of M. Poitevin?

Firstly. Dr. Anthony admits that the best enamels produced by Poitevin are far inferior to those of Lafon de Camarsac, and, therefore, no comparison ought to be established between them. One produces daily and regularly enamels of the finest quality, bright and deep in tones of the richest colour—in fact, exquisite, to use the very terms of the article referred to—and the other merely points out the application of his process to the production of enamels. The many experiments made by him are until now unsatisfactory, owing perhaps to the want of good operation, but perhaps also to some defect in the process.

Secondly. Lafon de Camarsac keeps secret his *modus operandi*, it is true; but he does not keep exclusively for himself the privilege of producing pictures on enamel; he does them for anyone and from any negative. Devoted to the ceramic art, he confines himself to the operation of enamelling, and by doing so renders greater service to the profession than if he were to publish his process and let it fall into the hands of everyone. Is it not an advantage for every photographer to be sure of the good execution of his pictures on enamel by trusting it to a special artist, rather to have to do it himself and be exposed to all the failures of a process which requires an immense practice, application, and study, besides the trouble and expenses of the necessary tools, furnaces, &c., &c., &c.

Thus Mr. Poitevin gives to the public the details of a process which has hitherto been fruitless to himself, while, on the contrary, Lafon de Camarsac practises for the public his method with a certainty of success entirely due to his skill and careful operation; consequently, his reticence, if there be reticence, is more beneficial in the result than the liberality of the other.

The unrivalled superiority of enamels over any other method of printing photographs is becoming more and more appreciated; it was markedly noticed in the report of the jurors at the Dublin International Exhibition, and I hope shortly to lay before you a complete series of the different applications of the Lafon de Camarsac process, illustrating all the resources of the photoceramic art.—Believe me, dear sir, yours truly, Camille Silvy.

30, *Porchester Terrace, Bayswater, Oct.* 30*th*, 1865.

[Those who knew the courteous character of Dr. Anthony will not for a moment think that he intended to express anything unfair or offensive to M. Camarsac, whose works he warmly appreciates. The extensive liberality of photographers of eminence, generally, in publishing full details of their operations, depending on personal skill and culture, and not on secret methods, for their superiority, naturally induces a feeling of regret when reticence is exercised by anyone, and that regret is increased when it is in relation to a process capable of such beautiful and permanent results, and hence to the general advancement of our art. We saw the admirable example of Camarsac's process exhibited by M. Silvy at Dublin, and shall look with interest and pleasure for the promised sight of a complete series of illustrations of this most important and beautiful branch of photography. —Ed.]

NITRATE BATH WITH ORGANIC MATTER.

Sir,—In my letter to you some months ago, part of which was quoted in your article of April 21, 1865, I concluded by remarking, "I will try by experiment to form an exact formula." I now, after a summer's experience, come to the front with measured modesty, but decided confidence, to recommend every one to try my bath, if they would have good result at little cost.

I have only this to say, that I will guarantee to produce, in the same space of time, with the same negative and my 20-grain bath, as good prints as any other person shall produce with 60, 80, or more grains per ounce of their bath; and that my compound shall, without altering it, produce good results from a greater variety of negatives, very soft, very hard, than any other. The simplicity of its preparation, I think, should save my friend, the "Photographer's Assistant," the trouble of calling it "complex." I fear his remarks would appear, to the readers of his Jottings of May 19, 1865 (No. 3), more like a desire to give us only nitrate of soda, rather than join hands, with pleasure, to produce as many means as possible for the general good.* Seeing, however, that so simple a formula as that given in April 21, 1865, was called complex, I have now tried to make it so plain that a "man, though a fool, cannot err therein." The formula now is:—Nitrate of silver, 1600 grains; boiling water, cooled until it is only warm, 80 ounces, being a 20-grain plain bath; strongest liquor of ammonia, 2 drachms. Dissolve some gelatine by first placing it into cold water, then, after two hours, dissolve by a slow heat, and add some of this to the warm silver solution; shake well up, and continue to add gelatine until you find it in just the condition to go freely through a new filtering paper; this is the only test to know how much gelatine to add, or when you have added sufficient. The bath, when cold, is immediately fit for use, as per former instructions in Photographic News, April 21, 1865. Particular attention must be paid to the few and apparently simple things; but the ease and certainty of working depend on the small things. After this bath is first made, and passed through a new filtering paper, the paper cannot be used again, because there is contained in it an excess of gelatine, which hardens the paper and prevents the bath going through. This will more than likely happen consecutively for the first three times, after which you will not be troubled in this way, unless too much gelatine is in the bath, when you must add plain bath to make it flow easily; in fact, the condition of the filtering is the surest guide. Observe, also, after working the bath, and you find new gelatine necessary; after adding it, your filtering papers will be made hard for a time or two; then throw them in the waste, and all will go smoothly again. In the filtering the solution into the bottle it forms some bubbles; these, if left in the bottle, will not burst, nor can you put them away in any other way than to place the bottle of bath into a plate, and continue the filtering in the bottle to overflowing; the overflow drives out all the bubbles, leaving the liquor clear; if the bubbles remain they would give great trouble in floating the paper. Any toning will do: we use the lime-bath.

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* Our correspondent will see from an article in our last that our esteemed contributor, the "Photographer's Assistant," so far from feeling jealousy, has tested the gelatine bath, and speaks of it very highly.—Ed.

Saying so much about gelatine, of which I am a great patron and admirer, brings my mind to the new iron developer with gelatine. As soon as I saw the formula of Mr. Carey Lea, I tried it with moderate success; an idea of using acetic acid was made known; then Mr. Hughes gave a formula, and, since its publication, I have continued to use the gelatine and iron in combination with acetic acid. I made a batch with his formula, and it worked well for one week, then its effects were as if too much acid were present. By adding equal bulk of plain iron solution all was right again for one week, when the remnant of this set up the same action as after the first week. I again added plain iron solution, and all was well to the end. I now make smaller quantities, and oftener. In haste, asking excuse for haste, or I should have said much more of this developer,—I am, faithfully yours, John Palmer.

58 & 68, *Union Street, Stonehouse, Oct.* 24, 1865.

DISCOVERY OF THE ACTION OF LIGHT ON BICHROMATES AND GELATINE.

Sir,—In the history of an art like photography, the progress of which depends so much on minute steps and slight improvements, it is difficult to preserve the precise record of every modification on which that advancement depends. It should not be difficult, however, to mark the broad phases of discovery, and assign to each originator his distinct honour for contributions to the art science. I have recently noticed that one of the claims which I had always understood was recognised as beyond challenge has been questioned or denied. I refer to the discovery, by Mr. Mungo Ponton, that bichromate of potash in combination with soluble organic matter became insoluble under the action of light, a discovery upon which has been based almost every photo-engraving, photo-lithographic, and photo-carbon process, which has been published.

The "Journal of the Photographic Society," in a trenchant article exposes a series of singular blunders in the photographic summary in the last number of the "Popular Science Review," and amongst other errors corrects one which assigns this discovery to Mr. Fox Talbot. In a letter in a contemporary photographic journal since published, a correspondent re-asserts that Talbot made the discovery in question, and quotes the Photographic News as an authority in support of his statement. The editor of your contemporary, in a note to this letter, after adjuring his correspondent not to be alarmed (as though anybody would dream of being alarmed by any discussion which might arise on the subject), also affirms that Mr. Fox Talbot made the discovery in question.

Now, sir, as everything relating to photography, prior to the establishment of photographic journals, belongs, so far as the public is concerned, to a pre-historic era, the records of such matters being meagre and scattered, may I appeal to you as an authority whom, with the correspondent in question, I recognise, as familiar with every phase of photographic progress, and having access to authentic records, to decide this matter for the photographic world.—Yours,

Another Member of the Photographic Society.

[The records of the early history of photography are, as our correspondent remarks, of a somewhat scattered character, but they are sufficiently complete to establish the question raised tolerably clearly. This cannot be done satisfactorily by an *ex cathedrâ* affirmation that one person did make the discovery, and another did not. In 1838 Mr. Mungo Ponton published his discovery that paper treated with a solution of bichromate of potash was sensitive to light, the effect of which was to darken the colour and render that colour insoluble, those parts protected from light remaining quite soluble. Mr. Robert Hunt, in stating the matter some years later, says Ponton discovered that well-sized paper was necessary. In 1840 M. Becquerel undertook a series of experiments to investigate the action of light on combinations of chromic acid and organic matter, and he ascertained that the action in Ponton's process was due to the combination of the bichromate and the size of the paper, which became insoluble under the action of light. Twelve years later Mr. Fox Talbot, availing himself of the facts before discovered, mixed bichromate of potash and organic matter—gelatine being the organic matter employed—to obtain insolubility under the action of light as a necessary condition of an engraving process which he invented. This process we patented in 1852, and we are not aware that he published anything on the process earlier. Whether Mr. Ponton ever ascertained the theory upon which his discovery was based is not certain; but it was made tolerably clear in M. Becquerel's researches. Mr. Talbot has not, that we are aware of, ever made claim to his use of gelatine and bichromate as a discovery; but in any case it must be clear to every one that it is in no sense a discovery, but an application and further development of Ponton's discovery, which was further elucidated by Becquerel. For reference on these points we may mention Lerebour's "Treatise on Photography, 1843;" Hunt's "Researches on Light" (1848, we believe); Hunt's "Photography, 1851;" and the "Patent Records, 1852."—Ed.]

MEAGHER'S BINOCULAR CAMERA.

Sir,—I regret I am thus compelled to intrude on your space in a discussion in which your readers can have little interest. I am unwilling to seek the factitious publicity of discussing my work in the literary columns of your Journal; but the matter is forced upon me by others for their own purposes. Admit, for argument's sake, all they state to be true, namely, that all the parts of my camera were in existence before I manufactured it, some of them, as admitted in their letter (namely, the hinged focussing screen and the folding tailboard), have been abandoned as faulty; and it remained for me to produce those parts in combination, and, from what they admit to be a failure, to produce a thoroughly satisfactory instrument. This I may fairly assume that I have done, from the unanimous approval of every photographer using the camera. This is further confirmed by the verdict of five photographic juries, namely, the International Exhibition, 1862; the Photographic Society of Scotland, 1863; International Exhibition, Berlin, 1865; North London, 1865; and, lastly, the Dublin International Exhibition, 1865. Three out of the five awarded me medals, and the other two honourable mention; the latter being, in both cases, the highest award given for cameras.

Division of labour, so good in mechanical production, is certainly fatal to effective protest writing. In assertion No. 3 they state: Bellows cameras, including the stereoscopic size, were in existence in 1856; in No. 4, "Movable partitions were in existence about the same time." Where, then, is Mr. Hare's novelty of 1860 and 1862? Not surely in the adjustment for focus—very conveniently arranged by means of a screw at the back, for extending the front in precisely the same way as Mr. Kinnear had done it in 1857, nor yet in adapting the rack and pinion adjustment, as done by Mr. Lerebour, of Paris, in 1851.

With strange kind of taste they proceed to say you approved of this design as Mr. Hare's in 1860, you claimed it as your own in 1862, and awarded a medal for it to Mr. Meagher in 1865. The camera for which I have been awarded *three* medals possesses no feature in common with Mr. Hare's; in mine the bottom is folding, the screw moves the *back* of the camera, and, when extended, there is *no projection* beyond the baseboard, thus giving rigidity; the focussing screen is hinged, the swing-back moves from the centre, and is *not* hinged at the bottom. The introduction of bellows cameras, so far from causing folding tailboards to be abandoned, has rendered them essential in the construction of a really portable binocular camera.

In assertion No. 6 they say: "The swing-back.—Hundreds of photographers know that this, as used by the medallist, originated in the establishment of Ottewill and Co., long before its adoption by him." It is certainly singular that they allowed the award of the jury of the International Exhibition, 1862, and again the Photographic Society of Scotland, 1863, to remain unchallenged up to the present time. Further, they have shown no camera bearing any resemblance to mine. In their present catalogue, they have adopted Mr. Ross's universal camera; that gentleman, I believe, claiming, in the presence of the jury, the invention of the camera which they had exhibited at the North London Exhibition.

In assertion No. 7 they say: "The focussing screw, with folding bottom, was first applied to the purpose it serves in cameras (made by Mr. Wood, Optician, Cheapside), seven years ago." As I had never seen a camera with folding bottom, made by Mr. Wood, I called on that gentleman and submitted my camera to his inspection; he states that my plan differs from his, and, further, that he considers mine an improvement.

The protesters make a great point of my goods not being examined on the same day as theirs, or, as they state it, having been favoured with a private inspection, to be present at which the jurors must have come from Hornsey, Twickenham, and Highbury. So far from the jury coming to view my goods, I was not aware they were to be present on that day. Mr. King, of Bath, purchased a camera from my case, on condition that I would forward it per mail train on the following day, fitted with some additional fronts, &c. On application to the superintendent for permission to remove the camera, he said he had no power to grant my request; but as Mr. Hislop, chairman of the Class Committee, was in the building with the other jurors, the superintendent applied to him. Mr. Hislop, in giving me permission to remove the camera, asked if I would leave the key of my case, or have my goods examined then. I decided on the latter course. I may add that I am personally unacquainted with Mr. Hislop. I have given this explanation, as the jury, who were aware of the facts, I presume, considered it beneath their notice.

Lastly, they say, "If further proof was needed to show how little Mr. Meagher is entitled to call this camera his, to you, Mr. Editor, we must appeal." The gentleman thus appealed to declares the camera to be essentially mine.

With the protesters and their protests I have done, as I do not wish to occupy your space, and cannot afford time from my business for worthless discussion.—I am, sir, yours, &c.,

P. MEAGHER.

21, Southampton Row, High Holborn, W.C.

[We had hoped last week to have heard no more of this matter. Mr. Meagher had, however, a legitimate claim to reply, and with his reply the subject *must* drop.—ED.]

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Photographic Notes and Queries.

MR. ACKLAND'S MODIFIED FOTHERGILL PROCESS.

SIR,—I see in your last issue, dated Oct. 21st, you have a long article on the use of aceto-albumen for preparing dry collodion plates, and which seems to have given you a very favourable impression. You also appear to think it had never before been used, and is therefore quite new. But if you will kindly refer back to the PHOTOGRAPHIC NEWS, dated Feb. 21st, 1862, you will there find a letter of mine, signed "T. H.," detailing the mode of working the above compound. I had at that time used it some two or three years, and had taken pictures in all kinds of weather. I remember doing a photograph of a gentleman's villa for the architect, which was sent to the Architectural Exhibition in London at that time. I had only one day to take the negative, otherwise it would not have been in time for the exhibition. When I exposed the plate (it was 12 by 10) the sky was one solid black cloud, not a bright gleam from any quarter; it rained heavily all the time, and yet the plate turned out well.

You will see in my letter, referred to above, that it is not necessary to wash the plates after applying the aceto-albumen, as they can be developed quite as well without, which I attribute to the presence of acetic acid. But it is very important that they should be steeped for about ten minutes previous to development, and I believe inattention to this latter is one great source of failure in all dry processes. In my experience, this is the cause of clouding in tannin plates. If silver and pyro be applied to a plate before the tannin is well washed off, it produces a stain just the same as tannin, if applied before the silver was completely removed. Now, sir, if your readers will examine those dry processes that are most successful, they will find as a rule the plates so prepared have an acid reaction instead of being alkaline. Hence, then, cleanliness in working. If any of your readers will try gum arabic, from 5 to 10 grains to the ounce of water, and a few drops of acetic acid to make the plates work clean, I think they will be quite pleased with the beauty of the results, only be sure and steep the plates well before development, as the gum is not very readily removed without.

I almost forgot to say what plan I adopted to wash my plates so as to leave a uniform quantity of silver in all my plates, no matter what size. It is simply to wash them well in one-third the number of ounces of distilled water that there are square inches in the plate that is being coated. Then apply the preservative.—Yours truly, THOS. HEAVISIDE.

Queen Street, Durham, Oct. 23rd, 1865.

[Amongst many good qualities, the point of importance upon which we chiefly laid stress, in describing Mr. Ackland's process, was the fact that the whole of the free silver is removed from the plate by thorough washing, and then a definite quantity added in the albumen solution; thus securing certainty. The plan of washing mentioned by our correspondent is a very ingenious one for getting approximate certainty, but even this, in different hands, would give different results, because the mode of manipulating as well as the quantity of water will affect the proportion of silver left.—ED.]

THE DOUBTFUL MEDAL OF THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

SIR,—As I find a good deal of dissatisfaction still exists with regard to the award of a medal to Mr. Warner, will you allow me to state that, as our members are somewhat widely dispersed, it is not probable that a decision will be arrived at until the general meeting after Christmas, when the result shall be made known. Meanwhile, it should be borne in mind that, although we are quite ready to acknowledge Mr. Restall's merits, he has not thought proper to put himself in communication with the Society in any way, and the judges can hardly be expected to make awards to those who do not care to seek them.—I am, sir, yours faithfully, SYDNEY HODGES, Sec.

BLISTERS, &c.

SIR,—After a fortnight's absence from home, I took up the NEWS last night to *devour* the contents thereof, and found it rich in subjects on which I had intended to trouble you with a few lines; but the words being taken out of my pen, all I can do is to write a sort of confirmatory letter. To be brief, then, my experience exactly coincides with Mr. Burgess's regarding the gelatino-iron developer, and with "Quarto" in the matter of blisters.

The dense patches of which Mr. Burgess speaks are caused by irregular and *not sufficient* heating of the plate *before* varnishing. Thorough warmth is essential. They will appear after revarnishing even, if the glass be not sufficiently heated. The tendency of the films to split I found quite as bad as with any other developer; but after all, that evil results, in most cases, from imperfect cleaning of the plates. In my humble opinion, nothing cleanses glasses so thoroughly as old collodion, especially if used after the bichromate of potash and sulphuric acid, described in your pages some weeks ago.

As to blisters. They are "the unkindest cut of all" to photographers, and are, as you say, very little understood. I have tried half the samples of paper in the market, and *all* the remedies for the avoidance or cure of these plagues, but all to the same end, except, in one instance, when I used nitrate of soda in the silver bath, which I did successfully for four or five weeks, when, as if I had had enough smooth sailing, another grisly phantom (no, not a phantom, a disagreeable reality) appeared to scare my new-born hopes away. You will see, by enclosed prints (which, by the way, are old ones) that the albumen is eaten off in places. What is the cause?

The strange manner in which blisters attack one portion of a sheet, leaving the other intact, is most inexplicable; for instance, all my small prints only used to blister, and anon the larger sizes, and to night, out of about sixty prints, only one whole plate size is attacked, and that badly.

Do you think the permanency of prints is affected by them? because, after blotting off, they usually disappear. I am afraid that what I have written is not very *useful*, but it is a sort of melancholy satisfaction to know one is not alone in these "sloughs of despond." P. H.

[It is probable that the removal of the albumen is caused by the use of the bath too weak. Try strengthening it by the addition of silver. As a rule, we do not see any reason to believe that the permanency of the print is endangered by the presence of blisters, especially where they disappear in drying. Sometimes we have seen marks of a darker colour left wherever a blister has appeared, and, in such case, we should fear some imperfect fixation in such places. The only remedies we know, which photographers themselves can apply, consist in avoiding the highly dessicated condition of the albumen by keeping the paper in a damp place a few hours before exciting, and in keeping the prints well immersed, face downwards. These precautions will, we think, lessen the risk of the evil.—Ed.]

Nitrate of Soda Blistering.

Sir,—I see that one of your correspondents in the News of last week says that he has not been troubled with blistering of albumenized paper since he has used nitrate of soda in his printing bath, and you express a wish to know the experience of others with the nitrate of soda.

Now, I have used it about three years constantly, or ever since its use was first recommended in the News, and it remains a mystery to me why it is not in more general use, as I can get much better prints with a twenty-five grain bath and nitrate of soda than I can with a forty-grain bath without it. I never yet succeeded in using a forty-grain bath a week without having to decolourize it, while my nitrate of soda bath very seldom needs any doctoring of any kind, as in standing from one day's use to the next, it usually precipitates all the colouring matter, and leaves the upper portion fit for use.

But with regard to the blistering, I wish I could confirm your correspondent's assertion that the nitrate of soda is a preventive; but the sad truth is that blistering is my greatest trouble.

I have no doubt that the cause of the happy change in his case is, not the nitrate of soda, but the *weather*.

A hot, dry atmosphere always makes the blistering worse, and I have invariably found a much less tendency to this fault in cold or wet weather.

The chief thing that puzzles me is the action of the hypo in bringing the paper to such a state that it blisters immediately on contact with water.

I have been making a few experiments, but I cannot cause the paper to blister with any amount of soaking unless it has previously been through the *hypo*.

Has Mr. Cooper (who seems to have tried nearly every way of printing) found any way of getting rid of this trouble? or do you think your correspondent, "The Photographer's Assistant," from whose papers I have got many a lesson, can help me at all in this matter?

With thanks for your insertion of my former letter on this subject, I remain, sir, yours very truly, Quarto.

P.S. I enclose a print on weak bath. Please to give your opinion of it.

[See the remarks of "A Photographer's Assistant" in our last. The print enclosed, as the result of a weak bath, is as perfect as we could possibly wish to see.—Ed.]

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Talk in the Studio.

Amenities of Journalism.—The last number of the *Photographic Notes* devotes a considerable portion of its columns to matters pertaining to the late North London Exhibition, and, amongst other things, undertakes to explain why Mr. Dallmeyer was "favoured" with a medal. In doing so it premises that it "will not shrink" from the task, because it must introduce some "unpleasant personalities" into the matter, being, as it adds, "the only independent and plain spoken Photographic Journal in England"! A series of reasons for the above mentioned "favour," consisting of these "unpleasant personalities," follows. One of the first suggested is that "Mr. Dallmeyer resides out of town with the family of Mr. Simpson's [one of the jurors] sister-in-law!" Now, absurd as it may appear to notice such a statement, and little as the fact may interest any one, we are bound to say that there is not a word of truth in it. Mr. Simpson has not a sister-in-law living within two hundred miles of town, nor has he any such relative or family connection whom Mr. Dallmeyer ever saw in his life. It is possible the writer was unaware of the untruth of his statement; we hope he was. He could not know anything of the matter himself, and from this and other similar groundless statements made, which do not concern us to correct, we conclude that he is the dupe of unscrupulous persons who have an object to serve. We pass no comment on the manner of mind which could impute such a circumstance, if it had been true, as a motive actuating a public man in discharging a public duty. Other motives, of a still baser character, are then imputed to others, to which we shall not give currency, as we believe them to be as destitute of truth as that just mentioned. Regarding this medal to Mr. Dallmeyer, if it were awarded by favour at the North London Exhibition, how comes it that at the Dublin International Exhibition he received one for what the jurors style his "unrivalled photographic lenses," and that he obtained a medal at the Berlin International Exhibition and the London International Exhibition of 1862 for similar productions?

A Bogus "R.A." on "Bringing Home the May."—Another article on the North London Exhibition in the *Photographic Notes* just referred to, purports to give, as a communication from a friend of the Editor, the remarks of a Royal Academician on Mr. Robinson "Bringing Home the May," the writer, having some qualms of conscience, qualifying his report of the matter by giving the "remarks as far as he could remember them." The "remarks" are described as delivered by the "R.A." pointing to the "Bringing Home the May." We give one of these "remarks" as a type of the whole. "Here is a girl shading her eyes from a streaming sunlight, which falls in another direction on a figure behind her." Now, as every one knows who has seen the "May," it is what painters call a "close scene," in a thick forest, at an early hour on spring morning, the chief atmospheric effect being the admirable rendering of the misty appearance common to such an hour on such a morning. There is no girl shading her eyes with her hand, from either sunlight or anything else, in it. It is tolerably clear that the eaves-dropper professing to record the opinions of the "R.A." either didn't hear him, didn't understand him, didn't "remember" what he said, or that he fabricated the whole scene he sends to Mr. Sutton. That gentleman has, we believe, never seen the "May," and, living in his solitary island-home, is, it appears, easily imposed upon. What a pity that a man who has done good service in photography, whose journal has so often been a valuable record of interesting experiment and shrewd scientific and practical comments by its editor, should undertake to pass strictures on matters of which he personally knows nothing, and, being "coached" with incorrect information, become the tool of mischievous persons! We could, we think, mention the name of the reporter of this alleged conversation and his motive; but it would be fraught with so much of shame to him that we forbear. We only add that a number of other statements on the same subjects have about as much truth as that to which we have just referred, and that relating to Mr. Dallmeyer's residence. Some amusing remarks are made on Mr. Robinson, who is described as "not in the least" an artist. As the "Royal Academy" is here alluded to with much respect, and as connection with it seems to be regarded as the touchstone of art-knowledge, it may be interesting to mention that Mr. Robinson was a painter, and an exhibitor at the Royal Academy, long before any of the writers to whom we have just referred were heard of in connection with either photography or art.

Photography and Book Illustration.—Professor Hoffman's recently issued excellent manual of "Modern Chemistry," a work which all our readers should possess, is profusely illustrated, the engravings having been executed from photographs of the various instruments taken for the purpose. The Professor presented each of the gentlemen present at the farewell dinner, previous to his departure from England, with a copy of the work, and a fine photographic reproduction, now before us, of the scroll on parchment commemorating the occasion. This reproduction was admirably executed by Mr. Spiller.

Enlargements on Painter's Canvas.—Mr. J. E. Palmer, whose photographic enlargements on canvas for oil painting we have before had occasion to speak of in high terms, referring to the method described in M. Truchelut's specification published in our last, asks us to state that he does not employ either wax, spermaceti, gum elemi, or collodion in his method, and adds that he will guarantee them not to crack or peel from the canvas.

Collodio-Chloride on Canvas.—It will be obvious to any one disposed to try Truchelut's process of photographing on canvas, that the use of collodio-chloride of silver, instead of collodion requiring the use of a silver bath, will materially simplify the process, and probably improve the results.

Photographs of Metallic Structures.—Mr. Spiller informs us that he has recently turned photography to useful account in exhibiting the structures of steel.

Gelatine in Printing Bath.—An error occurs in the article in our last by "A Photographer's Assistant," p. 509. For "two ounces of gelatine," read "half an ounce of gelatine," as the proportion to be added to eighty ounces of silver bath. Some prints produced by this formula, with which we have been favoured by our esteemed contributor, are remarkably rich and fine. We hope shortly to have more to say on the subject.

To Correspondents.

L. U. D.—After using nitric acid for cleaning plates, it will be well to allow them to lie for a short time in a dilute solution of carbonate of soda—common washing soda will do. Then rinse thoroughly in clean water before drying. 2. It is most probable that the fault is in your negatives; if you have tried your bath, very strong and then weaker, and tried various samples of albumenized paper, and still get weak, mealy prints, it is probable that the negatives are wanting in vigour and contrast; and in such case it will be impossible to get good prints from them. The conditions in the nitrate bath which most favour mealiness are extreme weakness and acidity. If the toning bath be too new it will tend to the same results, and with weak or fogged negatives, it will be almost impossible to avoid the defect.

W. Fox.—Thanks for the portrait. You shall some time have one of those you desire. There is not one published.

T. G. M.—An easel with glass rest and reflector, for stopping out negatives, can be obtained, we should think, of some of the dealers. If not, any of the apparatus manufactures could make you one.

W. W. X.—You will find formulæ for preparing paper for developed enlargements in our last Year-Book. It would require too much space for repetition here. If collodio-chloride be employed on painters' canvas, the collodion must be of very powdery texture, or it will certainty crack off, and we do not know any method of preventing such an evil. See a paragraph in "Talk in the Studio" this week.

West Country.—For architecture, where straight lines are absolutely necessary, the triple is the best lens we have tried. Of those which you mention in your first list we prefer No. 1. decidedly. 2. We like the Kinnear form of camera for out-door work, if well made. For architectural subjects a swing-back is desirable; but it is not necessary for landscapes. 3. We don't know much of the lens you name; but in our experience a low price and imperfect, or at least a doubtful, instrument are inseparable. Of those in your list No. 1 undoubtedly. 4. The metallic-looking scum which arises in developing very often arises from the condition of the bath, which contains organic matter.

J. H. S.—In using the organic iron developer it is necessary to remember that the image becomes more intense, and non-actinic after drying; if the negative be intensified as usual, chalkiness is almost certain to be the result. 2. We have not tried the ammonia sulphate of iron with gelatine; but if Mr. Cherrill's formula be employed, a portion of sulphate of ammonia being present will produce a similar result. 3. The photographs sent are all very good, but all with the exception of No. 4 are slightly over-intensified. No. 4 is a soft, delicate good picture. It appears to us that with the organic element in the iron developer a power is gained which will be valuable if judiciously used, but which may be easily abused.

F. O. J. B. (Andover).—The lenses of the maker you name have generally the reputation of being quick acting. 2. So far as we remember, he describes his lenses by different numbers, and we cannot tell exactly to what you refer as his half-plate, and, therefore, cannot certainly state the distance required between the lens and sitter to produce a card-picture by it. But assuming the focus to be similar to that of most half-plate lenses, about nine inches, the distance would be about twenty-four feet.

Liquor Plumbi Diacetatis.—The peculiar greasy effect in drying which sometimes occurs with sensitized albumenized paper, when, instead of draining and drying evenly, the solution stands in drops or globules on the surface of the albumen, each one leaving a mark, is said to be caused by the paper being in too dry and horny a condition before sensitizing.

W. C. L.—The lens you name will not cover a whole-plate properly; it is, we believe, intended for card-pictures.

John Davenport.—Protoxide of iron is scarcely known in a state separate from the salts it forms, from its proneness to absorb oxygen, and pass into the peroxide. 2. We are not familiar with the term "pegmatite." Do you mean hematite? The latter substance is a peroxide of iron found native chiefly in the island of Elba.

J. Clarke.—The letter has been duly forwarded.

A Member of the Photographic Society.—Thanks for the well-meant information. You are, however, in error, as we are in possession of fuller and more accurate information. The gentleman referred to has been for many years a colourist of photographs, but has little experience or knowledge of photography. When you describe yourself as a "London Photographer of thirty-two years' standing," are you making an error, or suggesting that you had a knowledge of it six years before Daguerre or Talbot announced their discoveries? It is only just over twenty-six years since these gentlemen first made public their experiments, their announcements having been made in the spring of 1839.

Zenophon.—We are glad to hear of your success with the collodio-chloride, and obliged by your courteous remarks. 2. We have not had much experience with either, but believe that No. I will work in your room, and think that it will be quickest.

J. B. H.—You can throw down the silver as a sulphide, by adding liver of sulphur, as described in our Year-Book, or you may use with advantage Mr. Hart's "Silver Saver."

C. B. P.—We cannot tell you where you can buy negatives of paintings by old masters.

R. L.—The series of difficulties you describe appear to arise chiefly from an unsuitable sample of collodio-chloride, the collodion used being apparently too contractile. This is the cause of the tendency to leave the glass, and the splitting in drying. It is a trouble we have never met with, either in the samples made by ourselves or by Mawson and Swan. The blueness of the image is due to over-toning; a very old and nearly exhausted acetate bath answers best, and the plate should be removed the moment the toning is seen to commence. We have obtained some pleasant sepia tones without toning at all. The feebleness of the image may be due to the use of a thin negative, or to some fault in the preparation, but we cannot say which. The print being red and blue in patches, when it comes from the pressure-frame, looks like a fault in the collodion. We shall have something more to say on the subject shortly. 2. We are glad to hear of your success with Mr. Hughes's formula for the gelatine developer. When too much intensity is obtained, a little of a plain fresh solution of iron should be added.

Photo-Juvenis.—We have not tried the solution you mention for toning. It will not fix the print.

E. K.—We shall be glad to learn particulars of your case as it progresses. We have recently heard of another case of a professional photographer who is suffering from symptoms of paralysis from the use of cyanide.

J. E. Palmer.—We shall be glad to hear further particulars of your new process. We make the announcement in regard to your process on canvas in another column.

A. B.—It is not necessary to have a very large camera for enlarging if the solar camera method be employed, as the paper is not placed in the camera, but on a screen in the darkened room. We cannot tell you the price of condensers. A half-plate Lerebour lens would doubtless answer for the work. The camera you describe might be made by lengthening its body to answer for enlarging negatives on the plan frequently described in our columns. 2. The question, "Which is the most rapid lens manufactured for the winter season?" is too indefinite for us to afford you a satisfactory answer, as you do not state for what kind of work, or for what sized plates, it is required. If for portrait work, there are several rapid lens for different sizes made by the best manufacturers. 3. The collodion you mention is, we believe, very good and very sensitive; but we are not aware that it is much more rapid than that of some other manufacturers. If you find it so, you will do well to adhere to its use.

An Outsider.—The method of colouring in oil at the back of a print made transparent has frequently been tried with some amount of success. The difficulty you mention is a common one; the large amount of resinous or fatty bodies necessary in the work generally causing a tendency in the picture to turn yellow. Wax will probably have less tendency to this defect than oil or turpentine. Development on albumenized paper is not generally successful, the whites generally turning yellow. Enlarged prints on albumenized paper, printed out without development, will probably answer your purpose best, and these can be obtained, but the process requires sunlight, not always to be secured in this country.

J. A. (Swansea).—Information on the use of collodio-chloride for printing on opal glass is to be found in various numbers of the present year. An article on our method of working with it will be found in the News for May 12th. The information on the use of the nitrate of soda in the printing bath is to be found chiefly in many communications in our eighth volume (1864). It is not necessary to add fresh nitrate of soda when adding silver to strengthen the bath. We have not tried the tannin process much for printing on opal glass; but it is not in our experience nearly so easy to get good prints by it for examination by reflected light as by the collodio-chloride process.

X. Y. Z.—You will obtain Turnbull's boards, which are fine cardboards, of the artists' colourmen or stationers. 2. The term "stippling a negative" refers to working on a negative with a fine pencil and water colour, for the purpose of securing gradation or detail not present. It is, however, not of much service for such a purpose, and could only be of value in a defective negative. It is a plan at times useful in removing freckles, wrinkles, or strongly-marked lines, but requires managing with great delicacy and skill. 3. There is no plan for getting a clean background so effective as good manipulation. Uneven marking may sometimes result from the use of a coarse lumpy collodion; such a sample should be discarded. A bath out of order, or a bad sample of collodion, will sometimes cause stains and markings; to get rid of which the bath should be rectified or put aside, and a fresh sample of collodion employed. 4. You will find an enlarging camera described in our last Year-Book. The lens you mention will probably answer. A triple is best for the purpose.

Paul Jubber.—You will find details, with a diagram, of the mode of using the portrait-lens, with a magic-lantern, on p. 53 of our fifth volume. 2. We have published many articles on the production of photographic transparencies; a very complete article on the production of photographic slides for the magic-lantern, by Mr. Blanchard, appeared in our Year-Book for 1864, in which the plan commercially used by the writer was given. We agree with you as to the interest of this subject, and shall have pleasure in furnishing any other information you may require.

Light and Shade.—It is quite unimportant whether you burn your silvered-paper cuttings, and send the ashes, or send the cuttings themselves to the refiner. The ashes will occupy less bulk for carriage. Silver, in old pyrogallic acid solution, will become gradually precipitated by standing, especially if made alkaline. You can add the residue thrown down to the ashes. We shall publish, from time to time, all that is discovered regarding the new developer. The card is very good.

An article on the History of Alkaline Development, some Critical Notices, and communications from F. R. G. S., Ignoramus, John White, F. H. L., are compelled to stand over from press of matter.

Several Correspondents in our next.

Photographs Registered during the Past Week.

Mr. J. Roberts, Draycott, Staffordshire,
    Portrait of Lord Vernon,
    Portrait of Hon. Miss Fife.
Messrs. Minshull & Hughes, Chester,
    Five Portraits of Dr. Anson.
    Four Photographs of the Combermere Station at Chester.
Mr. E. Cox Walker, Liverpool,
    Three Portraits of Rev. Father Nugent.
Mr. W. T. Fisher, Great Yarmouth,
    Photograph of Great Yarmouth Life Boat.
Mr. J. Manley, Darlington,
    Three Photographs of F. E. B. Beaumont, Esq
Mr. W. Bartholomew, Egham,
    Portrait of John S. B. Monsell, LL.D.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 375.—November 10, 1865.

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PHOTOGRAPHIC REPRODUCTIONS OF PAINTINGS.

The art value of photography when employed in the reproduction of good paintings is beyond challenge, and is admitted alike by the most enthusiastic admirers of sun-painting, and by those who regard photography as a soulless and mechanical process—a servant of servants. We have, on more than one occasion, regretted that this branch of photography has received less attention in England than its importance demanded, only one or two gentlemen having made the subject a speciality, and acquired high skill in its prosecution. We are glad to believe, however, that the occasion for this reproach is ceasing to exist, and that the skilful reproduction of paintings has secured the attention of more than one artist-photographer whose associations and education afford the surest guarantee of success.

We have before us a series of reproductions, by Messrs. Lucas and Groom, of well-known modern paintings, which for perfection of rendering equal or surpass the best we have ever seen. The first feature which attracted our attention was the unusually harmonious and perfect translation of colour into chiaroscura which has been secured even in pictures presenting the greatest difficulties. Those of our readers who visited the exhibition of the Royal Academy last summer, will remember Armitage's striking picture entitled "Esther's Banquet," in which he illustrates the Old Testament narrative where the craven Haman prostrates himself before Esther to seek her intercession with Ahasuerus the king. The scene is gorgeous with the rich colouring of oriental draperies, and glowing with the splendours of a royal banquet. In the photograph everything is presented without any approach to crude, hard contrasts; delicate white muslin, or, more properly, fine linen, and heavy red or brilliant yellow draperies, all are rendered with perfect delicacy and perfect force, producing in the monochrome an admirably harmonious picture, in which the rich colours being absent, one is able to do justice to the excellent drawing in the artist's fine picture.

The next feature which struck us here was the remarkably perfect rendering in some of the pictures of the "handling" or mechanical treatment of each especial artist. All who are familiar with paintings know how much of the expression of a picture is due to the mode of handling. "Patience and sandpaper," Mr. Ruskin has remarked, "will not produce a picture;" and, it may be added, that sandpaper, by producing a tea-boardy, factitious finish, may often destroy half the expression which a picture in its earlier stages has possessed. How much of the admirable texture in the animals of Sir Edwin Landseer is due to the wonderful handling those only know who have examined them carefully and attempted to paint copies of them. An engraver, in reproducing this effect, may do it, and do it very perfectly, in *his* manner; but it is not the manner of the painter, and something of the charm is lost. In the perfect photographic reproduction, if something be lost at times in the inexact translation of colour into chiaroscura, much is gained in this wonderful fidelity in rendering the exact touch and manner of the master. Whatever of expression belongs to handling is secured, and this is important to the general art-public; whatever of instruction may be conveyed to the student by the examination of such details is further retained, a circumstance which gives to photographic reproductions a considerable value as aiding the studies of the young artist. In some of the specimens before us, we were, as we have said, especially struck by the singular preservation of these details in the photographic reproduction. In a single figure study by Girardot, entitled "Idleness," this effect is so striking as to render it difficult for a moment to divest the mind of the idea that a painting in monochrome is before the eyes; the impasting of the lights, the mode in which handling is made to aid in giving texture and roundness to the arms, are produced so faithfully that one is tempted to bring the feeling of touch to the aid of vision to acquire certainty that the picture is a photograph on albumenized paper, and not a painting.

Struck by the especial presence of these qualities, singular fidelity in rendering mechanical peculiarities, and the presence of an admirable degree of harmony in the pictures rarely obtained in reproducing oil paintings, we wrote to Mr. Lucas, asking if any special mode of working was adopted, anticipating for reply that the ordinary known photographic facilities were employed, and that the excellence was due to that exercise of skill and judgment difficult to describe, and impossible to impart. The answer was only in part what we anticipated. Ordinary photographic appliances, we were informed, were employed; but besides skill, taste, and judgment, there were certain specific modes of working also adopted, which, with ready courtesy, we were permitted to publish. The practice of Messrs. Lucas and Groom is in some respects opposed to that which is common with many photographers in copying oil paintings. Instead of working in the open air, and securing a diffused light approaching the picture equally from all directions, they secure a light from one specific direction, and that direction the same as that in which the picture was painted. Hence the secret of the perfect rendering of handling to which we have referred. Most photographers know that to secure the best effect, on examining a painting even of the most delicate kind, in which everything like impasto is absent, it should be placed in the same relation to the light in which it was painted. It is not unnatural, therefore, that in causing the lens to look at a picture and depict it, the same conditions should be conducive to perfect results. There are other points wherein the mode in which patience and judgment are employed in securing success are well worthy the attention of our readers. Without further comment, however, we give Mr. Lucas's letter:—

My Dear Sir,—In reply to your favour of the 31st ult., in which you have expressed your opinion of my reproductions in such flattering terms, I will endeavour to give some idea of the way in which I proceed, but must premise that in chemical process I have nothing to communicate, the means employed being those in the hands of every professional photographer.

Great care must of course be exercised in the lighting of the picture—this in the outset being the greatest obstacle that has to be overcome—to get it equally lighted in all parts, and free from glare. I hold it to be a grave error to attempt to copy a picture in the open air; the light should be as nearly assimilated to that in which the picture is painted as possible; the reason is obvious, for in many pictures the "handling" of the paint is made to play an important part in the effect of the picture; notably so in the rendering of different textures; sometimes, even the rotundity of a head is made to depend in a measure upon the "drag" of the brush; the artist, besides, painting, uses the paint to model with (if I may so express it). Clearly, then, if a portion of the effect be obtained by the shadows cast by the undulations of paint, it is wrong to so place the picture that this effect is lost, as it manifestly must be by putting the picture in the open air, with light falling upon it in all directions.

Many photographers would perhaps be surprised by the amount of labour entailed in obtaining the best possible results from a picture; this it is always my endeavour to do, and to that end I have frequently, and I think profitably, spent several days in the reproduction of one picture, many of those you have seen being prints from perhaps the 9th or 10th negative taken. I first take a trial negative, evenly developed, and obtain a print, by which I see the fair rendering of the subject; this indicates where the effect differs, which it most frequently does, from the original. I then proceed to endeavour, by modifying the development, to reproduce the true effect. This must naturally be a matter of feeling, and must depend, as you say, upon the judgment of the manipulator. I may instance Armitage's picture as a fair example of the difficulties presented, more especially as I think they have been successfully overcome. Those who remember the colouring of the picture will appreciate the extent to which this has been done. Esther's figure is draped in light muslin; the centre light in the picture is the garment hanging from the head of Haman, which is brilliant yellow; the kneeling soldier is clothed in dark red, and the tapestry which forms the principal part of the back ground is a very deep dull green, with the pattern very indifferently marked; the relief from this of the figure of the king depends much more upon difference of colour, which again is red, than upon chiaroscuro.

To obtain a successful rendering, I think I am within the mark in saying that at least a dozen negatives of this picture were taken, and it is to the result of this painstaking that any credit that may be accorded me is mainly due. Trusting that your having asked me for this communication may excuse any seeming egotism,—I remain dear sir, faithfully yours,

Arthur Lucas.

37, *Wigmore Street, W., November 6th*, 1865.

Herein is indicated the true secret of success. The prerequisites are, of course, first, sufficient knowledge and artistic perception to understand in what success depends, and recognize a copy which fully reproduces the points in the original; and, next, a mastery over the conditions of working. After these prerequisites come the great primary qualifications for all excellence—a resolve to be content with nothing short of the very best result which can be obtained, and perseverance to work patiently until that end is secured. The results we have before us well repay the effort, really leaving nothing to be desired in this important branch of the art. Besides the fine copy of Armitage's picture already referred to, there are before us a couple of admirable shipwreck scenes by Duncan; Dever's "Please have you seen Mother?" Wyburd's graceful picture, "The Footstep"; and a couple of single figures by Girardot, which we commend to photographers for their simplicity, as capital studies for effects of back ground, accessories, and pose, all within the capability of photography to compass, and affording some excellent suggestions to photographers.

We have also on our table a series of reproductions by Mr. H. Hering, which have been awaiting our attention for some time. These also afford gratifying proof of the progress of this branch of the art, both in the excellence of the copies and in the illustration they afford of the fact that copyright photographic impressions of original pictures are becoming a distinct, and, we hope, a successful and important branch of the publishing trade in this country, as it has long been on the continent. Here we have fine copies of Goodall, Philip, Le Jeune, Wyburd, Ansdell, and others. Le Jeune's paintings are singularly satisfactory in the photographic reproductions; a little picture of "Ploughing" being as charming a thing as ever we have seen. Mr. Hering has also given his attention to another branch of reproductions which is in our estimation most interesting and important; we mean the copying of choice and rare engravings. The examples with which he has favoured us are, we think, absolutely the best we have ever seen, having the delicacy, force, and colour, and almost the luscious texture of fine proof engravings. Here is a Holbein's Madonna, and a Raphael's Florence La Belle Jardinière, each possessing a perfection of tone, in pure black, without a suspicion of grey or blue, or a hint of rustiness, which we have scarcely ever seen in photography.

It affords us much pleasure to see gentlemen who by education and association are so familiar with painting and painters devoting their energies to an undertaking for which photography is so essentially fitted, and which ought, and we trust will, bring them reputation and profit, whilst it certainly does confer a boon on the art-world generally.

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THE HISTORY OF ALKALINE DEVELOPMENT.

A tardy combatant presenting himself on the field long after the struggle was over and nearly forgotten, accounted for his delayed appearance by saying that he "had been falling back for a spring." An article in a contemporary, purporting to be "some" facts in the history of alkaline development, comes like the tardy combatant into a discussion on that subject, which originated nearly six months ago in the *Journal* of the Photographic Society, and was, we had believed, long since closed and nearly forgotten. Whilst our intervention was unnecessary, we took no part in the controversy. As, however, the article in question only states "some" facts and ignores others, and as a statement of the whole is necessary to the elucidation of truth, it becomes incumbent upon us—many of the facts to which we refer having been only recorded or first published in our own columns—to complete the history, as partial truth is often suggestive of whole untruth.

We shall be as brief as possible; stating facts, and avoiding unnecessary discussion. An atmosphere of strife, even in the cause of truth, is not a wholesome one, although it becomes at times inevitable to every honest man. It is not pleasant to be under the constant necessity of re-examining those facts which had been duly investigated, labelled, and put away in the mind's store-house as satisfactorily decided; but it becomes imperative if these facts have any interest and are boldly impugned.

Almost every great improvement in photography has been the result of the combined labours of many experimentalists. One discovers a new fact; another ascertains the laws upon which it depends; a third makes new applications or developments of it; and the matter progresses into a definite system of general application. Alkaline development for dry plates is no exception to this rule, and we proceed to give the summary of facts which mark its history, or led to its discovery, adopting, for the more easy correction of error, the same method of stating the case which is employed in the article in question.

In the *American Journal of Photography*, July 15th, 1862, (see also Photographic News, Aug. 8th, 1862) Mr. Borda published an article entitled a "New Rapid Dry Process," in which he stated that, acting on a suggestion from Mr. H. J. Anthony, he had tried the fumes of ammonia as an accelerator in dry-plate photography. Mr. Anthony, he states, had, *some years previously*, submitted a dry plate to the fumes of ammonia, and secured a good negative with very short exposure. Mr. Borda, after first trying tannin plates, applied this fuming to various kinds of dry plates, and it may be of interest here to quote his own remarks on the comparative results obtained.

> My experiments with fuming did not stop with the tannin plate. I thought it too valuable not to apply it to other processes, and it naturally occurred to me to try some dry process quicker than the tannin. I tried the resin process, and first, on its own merits. I succeeded with it beyond all my expectations, and by a ramble in our mountains, in which I filled every one of my double dry-plate holders with a tannin plate and a resin plate, duplicating each view. I ascertained beyond a doubt that the resin plate was at least twice as quick as the tannin plate. The collodion was the same. The resin plate, with half the exposure, gave more softness, and more details in the shadows. The fuming by ammonia accelerated the resin plate fully in proportion, and six to eight seconds gave me a good negative, where fully fifteen were required with the tannin. With a quarter tube and no diaphragm, I obtained, with the resin plate, in one second, a negative full of details in the shadows.

Mr. Borda first tried the fuming before exposure, but subsequently found that it was as efficient and more convenient applied after exposure and before development, and in doing this he first ascertained—without, however, perceiving its significancy—*that the image could be developed with the fumes of ammonia.* We again give his own words. He says, "I soon ascertained also that it was not necessary to fume the plate before exposure, but merely before development. * * * While making the above experiments, it happened several times that a tannin plate, from which the free nitrate could not have been washed off thoroughly, gave me *a faint image of the high lights* when soaked in warm water, *after fuming with ammonia, and before any developer was used.*"

Nearly three months later Mr. Glover, an able photographer, now, alas! dead, published in the *British Journal* of October 1st, 1862, an article entitled "On Dry Development of Dry Plates," in which he detailed his experience with Mr. Borda's method, verifying and further developing the same fact, a fully detailed image being obtained by fuming. Employing plates prepared with tannin and honey, he fumed them after exposure. We give the result in his own words:—

> On taking out to examine, I was most agreeably surprised to find a fully developed image, displaying all the details, down to the very shadows, as distinct as the negative which had had the full exposure; but of course lacking the necessary intensity, which, in amount, I could only compare to the appearance of a glass positive when viewed by transmitted light. The plate was again subjected to the action of the gas, but with no marked increase of vigour.
>
> I proceeded next to develop in my usual way, by soaking about two minutes in water, then covering with a solution of pyrogallic acid, without either acid or silver. Under this action I could not discover any addition to the intensity. On adding the silver with an additional quantity of citric acid, my hopes were doomed to disappointment, as a cloudy deposit commenced, which completely veiled every trace of an image, with the exception of the highest lights.

Some further experiments are detailed, the final result of which he described as encouraging, "although not so clean and free from defects as the plate exposed and developed by the usual method." He further expresses an opinion that the presence of free nitrate of silver and of honey played some part in producing the result. The editor, Mr. Shadbolt, commenting on the communication, says:—

> The experiments above detailed are very interesting, but we are not so surprised at the results, because honey being a reducing agent, acts energetically upon nitrate of silver in the absence of free acid; hence the appearance of an image after the ammonia had acted upon the impressed plate. As, however, all the free nitrate of silver would have been reduced on the first application of ammonia, it is clear that no further application of it or of pyrogallic acid could intensify the image, there being no nitrate of silver left wherewith to perform the operation.

In the same month, October 23rd, Mr. T. M. Leahy, of Dublin, sent us a communication, which appeared in the Photographic News of November 7th, 1862. This letter contained not only the first announcement of the fact that the image on a tannin plate could be developed with a solution of ammonia, but that free nitrate of silver played no part in the development, and was unnecessary. Mr. Leahy had been experimenting with the American discovery of fuming, and he, like Mr. Glover, had remarked the fact which Mr. Borda first announced, that when the plate was moistened after it had been submitted to the ammonia vapour, an image appeared. He went further, therefore, and tried the ammonia in a liquid form with complete success. We give the statement in his own words:—

> In some experiments in the tannin and honey process, in which I tried fuming with ammonia as an accelerator, I remarked that, when the plate was washed after the fuming, the image came out very distinctly; it struck me that the ammoniacal vapour might have become, in some measure, fixed on the plate, and that, on the application of the washing water, it dissolved and acted as a developer. Following up this idea, I gave a plate a very short exposure in the camera, and *immersed* it in a very weak solution of ammonia; almost immediately the picture began to appear, and continued to come out until nearly all the details were visible. I then washed it well and applied the pyrogallic acid and silver, which rapidly completed the development of the picture, without the least sign of fogging or stain of any kind.
>
> This development of the latent image could not have resulted from any free nitrate being left in the film, as I not only wash it thoroughly after sensitizing, but also pour a 3-grain solution of chloride of sodium two or three times over it, when I again wash and pour on the tannin and honey solution. The use of the ammonia in the liquid form, I think, has one great advantage over the fuming—it acts equally; and the picture being washed before applying the pyrogallic acid and silver, no deposit (such as sometimes occurs when the *fuming* is carried to any extent) can take place.

This discovery, it will be observed, is not one of those in which a suggestive but hopeful result is obtained; but the discovery is complete, and the success perfect.

On the 15th of November, 1862, three weeks after we had received Mr. Leahy's letter, but only eight days after it was published, Major Russell published in the *British Journal* a communication "On Development with Ammonia," in which he describes his experiments with the American fuming system, which induced him to add ammonia to pyrogallic acid, and with it develop a plate. He recommends, as producing the best result, "one drop of the strongest solution (of ammonia) sold in four ounces of water," with "a few drops of alcoholic solution of pyrogallic acid," and adds that, if certain precautions are adopted, the "method appears to be easy and certain." He was less successful with ammonia, and adds:—"Ammonia will develop a picture by its action on tannin, if the exposure has been long enough, but it must be much longer than is required when pyrogallic acid is used the same way."

On the 16th of December, 1862, Mr. Leahy sent us another communication, in which he stated that he had ascertained that carbonate of soda answered almost as well as ammonia for developing tannin plates; and on the 4th of March, 1863, he wrote to say that he had found that lime water would develop tannin plates. The announcement of these facts will be found in pp. 2 and 130 of our seventh volume.

During the time which has elapsed since then, many workers have contributed their quota to the progress of alkaline development, amongst whom the names of England, Hughes, Sayce, Wardley, and others occur to our memory. To Major Russell, however, is chiefly due the energetic and skilful working out of this mode of development, and also of the methods of working by which it is best available for good and rapid results. In May, 1865, this gentleman described at the Photographic Society an important advance made in the use of alkaline development. In all the methods before used, a phantom image without vigour was produced by the alkaline development, which required intensifying in the usual way with silver and pyrogallic acid to give it printing qualities. In the improvement to which we refer all this is dispensed with. A film containing a thick body of bromide of silver is used, and sufficient intensity for printing is obtained by alkaline development without the use of any free nitrate whatever, the image being obtained by the reduction of the bromide of silver contained in the film.

This is, we believe, a succinct account of the origin and progress of alkaline development, in which no fact of importance is omitted, in which nothing is included which does not form a distinct link in the chain of evidence, and in which nothing is stated which is not capable of the easiest substantiation by reference to published documents. We may summarise the facts as follows, attaching to each the earliest date connected with it in the published records:—

July 15th, 1862, Mr. Borda published in America his method of fuming dry plates with ammonia, and obtained on tannin plates an imperfect image before applying developing solutions.

October 1st, 1862, Mr. Glover published his experiments in the same direction, and stated that by fuming an exposed tannin and honey plate he also obtained an image before applying developing solutions, with the advantage that it was fully detailed, but lacking intensity, which it was found difficult to secure satisfactorily, on account of a tendency to fog.

October 23rd, 1862 (published November 7th, 1862), Mr. Leahy announced his experiments with Mr. Borda's method, using tannin and honey, with which fuming gave him a distinct image, but also announced that he had discovered that perfect development was secured by the use of a solution of ammonia, and that by the aid of the usual solutions the plate rapidly intensified without stain or fog.

November 15th, 1862, Major Russell published his experiments with ammonia, announcing his discovery of its developing action, and recommending for tannin plates a solution containing ammonia and pyrogallic acid.

December 16th, 1862 (published on the 2nd of the following month), Mr. Leahy announced that carbonate of soda answered for development almost as well as ammonia; and on the 4th of March (published on the 13th of the same month) the same gentleman announced that lime-water would serve the same purpose. The significancy of these two announcements consists in the illustration they afford of the fact that it is the action of the alkali which is concerned in the operation, rather than of any property peculiar only to ammonia.

May 11th, 1865, Major Russell announced his discovery (apparently made some time before) that perfect negatives with printing intensity could be obtained with tannin and bromide of silver plates, by the use of the alkaline developer without any free nitrate whatever.

Having thus epitomized, we shall offer but one or two remarks on the statements which have rendered our notice of the matter necessary. The writer of the article to which we at the outset referred divides the history of alkaline development into four stages. The first, in which he states Mr. Anthony discovered the *accelerating* effects of ammonia on tannin plates; the second, in which he states that Mr. Glover discovered the *developing* action of the fumes of ammonia on tannin plates; the third, in which he states that Major Russell discovered that liquid ammonia, in conjunction with pyrogallic acid, was an energetic developer of tannin plates; and the fourth, in which he states that Mr. Sutton discovered that carbonate of soda might be substituted for ammonia, the date he ascribes this discovery being September, 1863. The article concludes by saying, "We are open to correction on any points advanced above which may be inconsistent with other published evidence which we have not seen. We should esteem it a favour if any error were pointed out, our only object being to render honour to whom honour is due." This seems fair and candid, and we supply the required corrections; we regret, however, that the desire expressed is scarcely borne out by previous remarks in the article, which show that the omission of the name of Mr. Leahy in these assumed stages is not the result of ignorance of his claims. His discovery of a method of securing perfect results with liquid ammonia, *used for the first time*, is described as no improvement on Mr. Glover's results, acknowledged as unsatisfactory, with the fumes of ammonia; and notwithstanding that it is stated that Mr. Leahy was not a reader of the Journal in which Mr. Glover's announcement appeared, and, as the writer states "he has reason to believe," was not aware of Mr. Glover's experiments, the communication in which the discovery of the action of liquid ammonia is announced is stigmatized as "only an echo of Mr. Glover's paper," which he had not seen! Having thus disposed of the matter by assertion in the direct face of proof, "Mr. Leahy and his friends" are alleged to be "thus put out of court, and their alleged claims shown to be groundless"! This mode of *showing* a claim to be groundless consists in abstaining from quoting a word of the letter containing it, and alleging that it is something which it is not. Mr. Leahy's discovery of a method of securing perfect results with a liquid, instead of imperfect results with a vapour, is a "modification which is no improvement," whilst Major Russell's discovery of the same or a similar fact some time later is styled a distinct stage in the history of the process. Facts in the hands of some writers seem as plastic as clay in the hands of the potter, but the fabric they form is also as easily shattered into atoms.

Just as completely ignored is the fact that Mr. Leahy first announced that carbonate of soda might be substituted for ammonia, the discovery being attributed to Mr. Sutton at a period nine months later than Mr. Leahy's publication; although, so far as we are aware, Mr. Sutton never claimed the discovery for himself, although he did systematize a method in which it is employed. The error in regard to carbonate of soda we are willing to believe is the result of imperfect knowledge, upon which we do not intend to comment.

In conclusion, we ask those concerned to examine the synopsis of history above stated, the extracts from published evidence given, and, if necessary, the respective articles upon which the whole history is based, for themselves. If *we* have omitted or misstated facts, or drawn erroneous deductions therefrom, it will afford us pleasure to set the matter right.

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Critical Notices.

The Magic Lantern: How to Buy and How to Use it. By "A Mere Phantom." (London: Houlston and Wright).

As the winter season rapidly approaches, amusement for long evenings and for festive occasions becomes a pleasant theme. The magic lantern, so long a favourite, has, by the aid of photography, extended both its favour and its usefulness with the general public, and has at the same time acquired an especial interest in the eyes of photographers. The little manual before us will, therefore, be especially welcome to a large number of our readers, as containing in a compact form just the information important to possess, and difficult to acquire without the costly and tardy operations involved in gaining experience. The different sizes, qualities, and prices of various lamps; the various modes of lighting, with the results; the modes of preparing gas where it is required; the various kinds of slides, and the means of getting moving effects and describing views; the mode of colouring slides; and the mode of working all the apparatus required, are detailed in some sixty pages of readable matter. As a sample of the whole we give an extract from the chapter

ON COLOURING SLIDES.

The facilities afforded by Photography for the production of Transparencies for the lantern have led many amateurs to desire such instructions as will enable them to colour photographic slides. A few brief directions are appended, though it should be premised that it is not at all desirable that any one who does not feel conscious of the possession of a certain amount of artistic skill and taste should attempt it.

Apparatus.—The easel,* an assortment of brushes and dabbers, an ivory and a steel palette knife, a small muller and slab, a palette, a penknife, an etching point, lithographic pen for outlines, pieces of linen or cotton rag.

Media.—Oil of spike-lavender, turpentine, varnish, ox-gall, Canada balsam.

Colours.—Italian pink for yellow, Prussian blue, Antwerp blue, crimson-lake, carmine.

These are the three primary colours, which are capable of yielding nearly all the rest by judicious mixture. The colours purchased should be those prepared for oil painting, in collapsible tubes, and the purpose for which they are intended should be explained to the colour maker.

The use of the muller and marble slab in well rubbing these colours down will soon be learned. For black, ivory or lamp black is used; for white, the glass is left uncoloured; for green, Prussian blue and Italian pink; for purple, lake and Prussian blue; for orange, lake and gamboge; for brown, either burnt sienna or a mixture of Prussian blue, lake, and Italian pink.

Glass.—Patent Plate and Flatted Crown are the two kinds obtainable. The former is expensive, and only necessary to be used when something of an exceptionally superior character is to be produced. The latter will answer most purposes if the following precaution be observed:—The two sides differ from each other, one being smooth and the other having gritty particles, which may be distinguished on drawing the nail across. The painting should be done on the smooth side, or if the photograph be prepared with a view to subsequent colouring, *it* should be taken on the smooth side.

A good medium for mixing the colours is transparent oil varnish, to which a few drops of liquor ammoniæ have been added.

In the case of a photograph no preliminary outlining is required, but where it is intended to reproduce a large engraving on a 3-inch disc, a reduced outline of the required size is first made upon paper, and this being laid under the glass, the outline is traced through with the appropriate material. This outline is then protected by a coat of varnish, and the colouring then begins, the sky first, then the extreme distance, and successively the middle distance and the foreground, increasing in intensity of colour and decision of outline as the objects approach the spectator. The required depth of colour will regulate the amount of varnish to be used, and small *dabs* should be made on a piece of glass before beginning to paint, in order to ascertain the quality, transparency, and depth of the colours. The remedy for excessive opacity is more varnish and ammonia. Two or three drops may be added to a teaspoonful of varnish.

The lithographic pen is to be used for tracing the outline.

Dabbers are made by burning down thick camel's-hair brushes to a round, stumpy end.

Another and very satisfactory method of colouring consists in using Aniline colours, known as Judson's dyes, or, better still, those prepared by Dr. Jacobsen for colouring photographs. In using these colours, the disagreeable smell of oils and varnishes is avoided, the only medium required being water.

Before using the colours, it is imperatively necessary that the glass on which the design is either sketched or photographed should be coated with albumen. When dry it is ready to receive the colours, the albumen acting as a mordant; a plain piece of glass should also be coated with albumen, on which to try the depth of colours; and great care must be taken to keep the colouring within the outlines, as, being dyes, these colours cannot be removed.

To prepare the albumen, take the white of an egg, and add to it one ounce and a half of water, beat all to a froth, and the liquid subsiding is fit for use.

HARMONIOUS COLOURING, ESPECIALLY AS APPLIED TO PHOTOGRAPHS. By An Artist Photographer. Fifth Edition. (London: James Newman.)

We learn from the preface of this fifth edition of "The Principles and Practice of Harmonious Colouring in Oil, Water, and Photographic Colours, especially as applied to Photographs on Paper, Glass, and Silver Plate," that four large editions have been exhausted in four years, a circumstance which proves beyond question the want of such a work, and the fitness of this book to supply the want. It is indeed a marvel of completeness, and undoubtedly the best shillingsworth we have ever seen of the kind. The present edition retains, with slight exception, everything given in former editions, and has several new chapters added, containing instructions for the various methods of colouring a photograph at the back, for the use of a new kind of body colour, for colouring enlargements in crayons, &c., &c. The closing words of the preface are worth quoting as illustrating the character and purpose of the book. "It must be understood," the author remarks, "that the treatment of a subject so large in a book so small as this must necessarily be can only be regarded as suggestive. To the thoughtful student we believe it will be sufficiently so to enable him, with average aptitude, care, and practice, to achieve the much-desired end—fidelity to nature, combined with artistic truth."

We had marked some passages for extract; but must from press of matter postpone reproducing them until another week.

A TREATISE ON SOLAR ACTION: Explaining the Causes of Light, Heat, Motion, and Electricity. By Thomas Ayers. (Yarmouth: George Noel, King Street.)

The author of this little treatise, an intelligent photographer, from whom occasional correspondence has appeared in our pages, believes that the phenomena of the universe "are susceptible of another and far different interpretation to any they have yet received," and believing this, he puts forth his theory in these pages, with sufficient perspicuity and modesty to entitle him to a considerate hearing from all interested in the study of natural philosophy. We have not in our pages space for a full discussion of the questions raised, and as the whole argument consists of a complete chain, we cannot extract or epitomise with fairness to the subject. We commend the work itself, therefore, which is brief, to all interested in the great questions of which it treats.

ENLARGING.

BY SAMUEL FRY.*

For the practical working of the process, we fix the original negative in an opening made for that purpose in the side of a room which can be entirely darkened. Outside this opening is a large mirror at an angle of 45° to the side of the room; this, reflecting the light from the sky (not sunlight) on to the negative, gives a steady, brilliant illumination. Inside the room is a camera of rather long focus (say 8 inches), with a stereoscopic double lens, so arranged on a stand that it can be brought close to the window, or taken away as far as desired.

By this simple arrangement a transparency of any dimensions, larger or smaller than the the original negative, is readily obtained. The steady, soft light yielded by the mirror outside the window is invaluable, the whole of the plate being equally illuminated. This transparency should not be varnished, as there is a chance af the structure of the varnish being magnified with the rest of the picture, which gives the appearance of a net-work pervading the surface of the enlargement, and greatly detracting from its beauty.

In focussing to obtain the transparency the utmost care must be used to obtain the finest possible focus, and for this reason it is that I was first induced to try working with the camera inside a perfectly dark room, rather than by a long camera on the conjugate focus principle; the total darkness of the room enables one to obtain the most absolute focus conceivable, without using a focussing cloth.

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* The easel described resembles those used for supporting a negative during the process of touching out spots, &c.—Ed.

* Continued from p. 495.

It is not out of place just to observe here that, whilst the parts of a negative which are in the finest focus appear to bear enlarging almost indefinitely, the coarser parts, or such as are only approximately sharp, lose enormously in the enlarging, and this to an extent which observation alone would induce one to believe. From a given negative almost any kind of transparency can be obtained, dependent upon exposure, and manner and time of development. For enlarging this transparency, I employ the ordinary solar camera, but with diffused instead of sunlight. As in taking the transparencies, the large mirror outside the opening of the room at an angle of 45° is again employed, and the condenser of 13 inches diameter is made to exactly fit the opening in the side of the room, a constant stream of parallel rays proceeds from this source, which is scarcely affected by clouds passing, or temporary obscuration of the sun's disc, and also requires no changing of position. As in ordinary solar cameras, these rays pass through the transparency, and then through a small portrait lens reversed, producing the enlarged image at a distance dependent on the size of the transparency and diameter of the lens. To support the large glasses on which the negatives are made, I have a frame, or easel, which can be advanced or withdrawn to any distance. I invariably use a flat dish for sensitizing the plates, by which a plate 24 by 19 can be safely done with two pints of solution. The plate is lowered by a silver hook, collodion side downwards, one edge of the plate being first placed at the bottom. If done steadily, the plate is sensitized with the same evenness as in a dipping bath which would require three gallons of bath solution to cover it.

This method of enlargement is that which, after careful investigation, and practical trial of each, we now employ in our own establishment, as giving the finest results, and being the only method that can be relied on for ordinary use in our changeable climate. It can be practised in any moderately fine weather, and almost any description of negative is available; whereas, by the solar camera, or Monckhoven's, special negatives are almost indispensable.

By this same process also may be made large transparencies for ornamental purposes, simply using the original negative, instead of a transparency, during the latter part of the process. I have seen these transparencies fitted into conservatory or staircase windows with beautiful effect.

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RESEARCHES UPON IODIDE OF POTASSIUM.

BY M. PAYEN.

The demands of photography have so greatly increased the consumption of iodide of potassium, that from being a comparatively insignificant product, employed to a small extent only in medicine, it has now become an important industrial product, the applications of which are daily expanding: no thorough investigation of the properties of iodide of potassium having been made since it has acquired its present scientific and commercial importance. M. Payen thought it a subject which he might profitably submit to examination. He says:—

After numerous experiments upon specimens regarded as pure, among those which are commonly delivered as pure to manufacturers, laboratories, and medical uses, I have arrived, either by means of the ordinary tests employed in such cases, or by means of new reactions, at recognizing that all the chemical or pharmaceutical products of this species exhibit a notable alkalinity due to variable proportions of from 2½ to 6 per cent. of carbonate of potassa (proportions determined by saturation with the normal liquor of sulphuric acid); and that always all contain iodized iodide of potassium.

During these experimental researches, I have also observed certain characteristics of iodide and bromide of potassium, which are not found in the alkaline chlorides.

Saturated aqueous solutions at a temperature of 72° to 74° Fah., either of bromide or of iodide of potassium, neutral, or slightly acid, or alkaline, placed in contact with amylaceous fecula, with four equivalents of water, act upon it in the cold, so as to make each grain acquire a volume from twenty-five to thirty times greater, if the total volume of the liquid permits. Nothing similar to this takes place with chloride of potassium, nor with chloride of sodium.

I propose now to describe more particularly the phenomena which take place with respect to iodide of potassium, either in its pure state, or as it is found among dealers of chemical or pharmaceutical products. Commercial iodide of potassium may easily be purified by saturating the potassa by hydriodic acid, and then eliminating the iodine, generally found in excess, by hydrosulphuric acid, ebullition, and filtration: the solution evaporated gives, upon cooling, crystals which, well drained, washed, and dried, no longer contain any foreign substance.*

The crystalline compound thus prepared, pure and perfectly neutral, acts upon fecula with such energy, that 1 gramme of the latter, mixed cold with 25 centigrammes of a saturated aqueous solution of iodide at the temperature of 72° Fah., soon becomes a colourless, translucent, coherent mass. The same reaction observed under the microscope, and increasing the proportion of liquid, shows each of the feculent granules swelled to such a degree as to occupy a volume thirty times greater; all the internal layers, concentric and of unequal cohesion, are dissolved: beside traces of foreign substances there remains only the external pellicle, but so thinned by its great extension, that to discern it, the quantity of light which traverses it, under the object-bearer of the microscope, must be greatly diminished. If we dilute it with water (ten times its volume), the translucent mass of fecula swells, and the liquid passes entirely through the filter, only with extreme slowness, and yet the limpid solution is not viscid, for it passes rapidly through a second filter. This solution contains almost the whole of the organic substance, the strong proportions of which are shown by the intensity of the colour immediately produced by a solution of iodine. In fact, there remains upon the washed filter only the almost imponderable pellicles, enormously distended, and rendered colourable by iodine.

The solutions of iodide of potassium determine a swelling of the fecula more or less prompt, according as they are more or less diluted with water; 1 volume of saturated iodide at the temperature of 72° Fah., diluted with 3 volumes of water, leaves most of the granules intact, or but slightly swelled. Some granules only were greatly swelled. With 3½ of water and upwards to 1 of solution, the liquid no longer exercises a sensible action upon the feculent granules; pure iodide of potassium in saturated solution at a temperature of 72° remains colourless, in closed vessels, not only in diffused light, for more than fifteen days, but also when exposed for two hours to the solar rays; it was the same with fecula swelled from 16 up to 25 times its volume of this solution of purified iodide.

The following experiment was made with a view of repeating the preceding experiments under slightly different conditions to verify a new theory of the decolouration of iodized starch by heat, and the return of this colouring upon cooling.

Eight cubic centimetres of the saturated solution of pure iodide of potassium, mixed with 5 decigrammes of fecula, formed a translucent magma, which remained colourless in diffused light during eight days; then 32 centigrammes of water were added, and the mixture was strongly agitated till the complete division of the magma was accomplished. The liquid being then diluted with 12 times its volume of water, contained 11.040 of organic matter; filtered slowly, one part of the limpid solution took, with iodine in excess, an intense violet colour; submitted to strong ebullition, a third part of the liquid decoloured by this temperature was projected from the tube. The tube was closed against the admission of air. Upon immersing the lower end of the tube in cold water, the violet colour was seen to reappear at the bottom of the tube first, and then to spread in proportion to the cooling.

The same phenomena took place in heating the closed tube to 212°, then cooling its lower part. The tint was sensibly weakened, doubtless in consequence of the slight loss of iodine converted into hydriodic acid. Therefore, in two instances, there remains, in the decoloured liquid after ebullition, sufficient iodine to produce the effect of dyeing at the bottom of the tube, while between this coloured portion and the surface of the liquid the uncooled liquid remains colourless. The disappearance of the violet colour by heat is therefore due, as we have admitted, to the dilation of the groups of amylaceous particles which their contraction by *cold* tinges anew. There is, then, cause to rectify what has recently been stated respecting the disappearance of the colour, which is due only to the disengagement of iodine, and of the return of the colour upon the appearance of the iodine momentarily carried to the surface of the liquid.

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* At least I have not found in the iodide of potassium, obtained from the principal manufacturers of this salt, either chloride or iodates, which would have demanded a special purification.

The above-named reactions also take place when we employ in these experiments the products sold as re-agents or as medicaments. Then, however, marked differences may charactize these products, generally more or less impure. If, for example, we operate upon a slightly alkaline iodide of potassium, containing traces of iodine in excess, the translucent mass of swelled grains of fecula will remain colourless for an hour or two, and even during one or two days; then they become coloured violet, more quickly in the air than in a closed vessel, in the light than in the dark, the colouring always beginning at the surface. This phenomenon seems to me to depend principally on the action of the carbonic acid in the atmosphere, which gradually converts the carbonate of potassa into sesqui- and bi-carbonate, leaving the iodine in excess more free to react upon the amylaceous substance. Besides, we may suppose that light also exercises some influence.

Three series of comparative experiments were instituted with a view of deciding these questions. Into an aqueous solution of iodide, very slightly alkaline and iodized, which did not directly colour the fecula, a current of carbonic acid gas was passed during four hours: the solution gradually acquired a yellowish tint, showing the presence of iodine in a free state, for then this solution immediately produced, upon its contact with the fecula, a violet colour, besides the swelling of the granules. The same experiment, repeated with pure iodide of potassium, produced neither the yellow tint in the liquid, nor the immediate colouring of the swelled fecula The passing, during the same time, of a current of air completely deprived of carbonic acid, did not determine the yellowish colouration of the same solution of very slightly alkaline and iodized iodide, while normal atmospheric air determined it in five hours of a controlled current, the colouring being due in this case, doubtless, to the carbonic acid contained in the atmosphere

The exposure during one or two hours of the iodized and alkaline iodide to the direct light of the sun determined the yellow colour and partial dissociation of the iodide in excess, while the same exposure to the sun produced no colour in the solution of purified iodide, nor the violet colour in the translucent magma obtained by the cold reaction of this neutral iodide upon the swelled granules of fecula. A saturated solution of iodide, slightly alkaline and iodized. preserved from access of light. acquired no perceptible tint during a month.

I also proposed to myself to test the influence which the combination of the affinities of oxygen for potassium, and of acetic acid for potassa, and of iodine upon the feculent substance, can exercise upon the separation of the iodide, by acting either upon the iodide containing a very slight excess of iodine, or upon purified iodide of potassium. The experiments appeared to verify the hypothesis that induced me to undertake them. In any case they have given a simple means of instantly distinguishing an iodide containing traces of iodine in excess from the pure compound.

In the first case, upon pouring drop by drop into the saturated aqueous solution of iodide a very slight excess of acetic acid, we may perceive a yellow tint; and then, again, upon mixing four or five per cent. of its weight of fecula with the solution, we see immediately appear a violet colour, more or less deep, throughout the mass.

Upon operating in the same manner upon the aqueous saturated solution of pure iodide of potassium, there was no colouring at the moment of adding the very slight excess of acetic acid; then, upon the addition of the fecula, the latter soon swelled, producing a colourless and translucent paste. However, in the closed tube, three-tenths of which only had been filled with the mixture, after a few moments a violet colouring appeared, spreading by degrees parallel with the surface, on the side of the tube endued with the mixture, then on the level of the mixture taken *en masse*. All the portion situated below this upper layer, the thickness of which gradually increased, preserved its whiteness and primitive translucency to the bottom of the tube.*

Conclusions.

1. Iodide of potassium, from different sources, sold either as a medicament or as a reagent, generally contains carbonate of potassa and iodine in excess.

2. Iodide of potassium, either pure or slightly alkaline and iodized, in saturated aqueous solution, swells the grains of fecula to the extent of increasing their bulk from 1 to 25 or 30, dissolving the internal substance, and giving an enormous extension to the external coating.

3. Bromide of potassium produces similar effects.

4. The alkaline chlorides determine neither the swelling of the fecula nor the solution of the amylaceous substance.

5. The saturated aqueous solution of iodide of potassium, diluted with 3½ volumes of water and upwards, is inert upon fecula when cold.

6. Carbonic acid gas partially sets free the iodine of the iodide of potassium, slightly alkaline and iodized.

7. Atmospheric air may produce an analogous effect: freed from carbonic acid, it did not separate iodine from the solution of iodide slightly alkaline and iodized.

8. Solution of iodide of potassium slightly alkaline and iodized is slowly coloured yellow under the influence of diffused light, and rapidly in the direct light of the sun. Protected from light the solution remains colourless for a long time, the partial separation of the iodine not having taken place.

9. Pure iodide of potassium also in saturated solution, in closed vessels, remains uncoloured in diffused light, during upwards of two hours in the sun: the swelled fecula, taken *en masse* by 16 to 25 times its volume of this pure solution, remains colourless under both these circumstances.

10. We may immediately recognise traces of iodine in excess in the exact proportions of the neutral compound, by means of a slight excess of acetic acid in the solution of iodide, and of 2 to 4 per cent of fecula: the latter swells. exhibiting the violet colour. If the iodide of potassium be pure, the whole mass will remain colourless and slowly assume a colour superficially, gradually growing thicker.

11. The remarkable property of bromide and iodide of potassium offers another means of characterising the amylaceous grounds in vegetable tissues.

12. The swelling of the concentric layers of the fecula, and their almost integral solution in bromide and iodide of potassium, which are inert upon cellulose,—the action of Schweitzer's reagent, which instantly dissolves pure cellulose, while it maintains by its very excess, and, during several years, swelled feculent granules, occupying twice their original bulk, united to oxide of copper, but not dissolved,—the swelling of the fecula in cold, and its solution in warm chloride of zinc, observed by M. Bèchamp—all these facts concur to show that cellulose and starch, possessing an identity of composition with many different properties, are isomeric: thus, we shall not admit, with M. Negeli, that grains of fecula are compounds of *cellulose* and *granulose*, nor, for a more cogent reason, that there will be found, conformably to the views of the same savan, six distinct immediate principles. In every grain of starch there are doubtless layers endowed with special properties, which manifest themselves specially upon contact of the iodine, and compel us to admit two different substances; but as many means of disaggregation show the identity of the effects of iodine, that neutral disatase, as well as various acids, convert simultaneously, or successively, the two portions into dextrine and glucose, it seems allowable to consider the whole mass of amylaceous grains,* as formed of an immediate principle in concentric layers which exhibit striking differences in their multiple degrees of cohesion. These new facts, as well as previous ones, prove that, except traces of foreign substances, every grain of purified fecula, constituted of a single immediate principle, presents concentric layers endued with a cohesion gradually decreasing in each of them, as in the whole mass of grains, from the exterior to the interior, or from the periphery to the centre.

13. We think we have shown that in presence of an excess

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* In this curious experiment it seemed to me that the iodide employed was completely free from iodine in excess. The influence of the oxygen of the air appears evident. In order to attempt directly assuring myself of it, and of proving that the supposed triple influence was, in fact, necessary for the pure iodide of potassium to cede the iodine to the fecula, I repeated the experiment in nitrogen gas, and then scarcely any traces of the violet colour appeared.

The presence of oxygen, then, appears as indispensable as that of light, for the colouring took place in the dark, but more slowly. However, I dare not venture yet to pronounce upon the very delicate theory of this complex reaction.

* Quite purified, and excepting some traces of foreign substances.

of iodine the alternate colouration and decolouration of the iodized starch belongs not to the volatilization and return of the iodine, but to a separation of the particles by heat and to a contraction due to the cooling which, by grouping them anew, causes the phenomenon of tingeing to appear.

14. As to the iodide of potassium intended for therapeutics, it is desirable that it be administered pure and in its natural state; that if in certain cases the physician wishes to prescribe iodized iodide of potassium, he must add the iodine in quantities exactly according to the prescription: we shall then have a second medicament capable of presenting several varieties.

15. The remarkable analogy presented by the phenomenon of the swelling of the amylaceous granules, both in bromide and iodide of potassium, appears to me of a nature to suggest new comparative physiological experiments upon this bromide, which, in this reaction, like the iodide, differs entirely from the alkaline chlorides.—*Les Mondes.*

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PHOTOGRAPHING FOLIAGE.

BY M. CAREY LEA.*

Every one knows the difficulty of obtaining satisfactory detail in the shaded parts of dense foliage; and, also, how much this difficulty is increased where there are included in the view any highly actinic objects, which impress themselves too quickly upon the film to permit of giving an expression as extended as the foliage would render advisable. It occurred to me some time since that the interposition of *pale green glass* would have the effect of stopping a part of the highly actinic rays, whilst it had little effect upon the green rays coming from the foliage.

I was prevented from trying this experiment by two causes; first, that no suitable pieces of glass came within my reach, fine plate glass being, of course, necessary, and neither too dark nor too light; and, further, by this reflection, that much of the light that *does* reach us from foliage is pure white light, reflected from polished surfaces of leaves. Such white light is extremely precious, and gives, for example, the ivy the beautiful effect with which all photographers are so familiar. Now, this white light *would*, of course, be diminished by the interposition of the coloured glass, and therefore the general effect of such interposition, whether good or bad, could only be determined by careful experiment.

My attention has been brought back to this subject by a few lines which the *Photographisches Archiv* for June copies from the Bavarian Kunst und Gewerbeblatt. In this extract, Herr Michell, of Antwerp, states that by placing a *bright blue glass* before the camera, he has succeeded in obtaining from trees, grass, meadows, &c., a much truer and livelier effect.

Blue glass would seem to be less favourable than *very pale* green; for example, it would scarcely check the effect of the skies in solarizing themselves, and the same with white objects; and the brightest blue glass is that covered with cobalt, which stops a great many of the rays emitted by foliage, causing trees, grass, &c., to assume a dark grey colour.

If there be any truth in the general principle that the details of foliage are best brought out by the interposition of a blue or green glass, a curious consequence will follow, viz., that the best landscape effects will be obtainable with lenses that have a slight greenish colour, and are not of the pure white colour, which is generally so much preferred. Moreover, it has lately been remarked—I think by Mr. Bow—that a greenish colour in the glass adds to the uniformity of illumination; for the central pencils are obliged to pass through a greater thickness of glass than the marginal, and are merely weakened, thus bringing them nearer the strength of the marginal.

Should these considerations be verified by experiment, it would be not a little curious to find coloured objectives preferred to pure white for landscape effects.

On the other hand, there cannot be the least doubt that the slightest brownish colour in a landscape lens, or combination, must be a most serious fault, as tending most to weaken precisely that light which we are most anxious to preserve.

The consideration, however, which I mentioned at the outset, viz., the probability that a very large part of the effective light which comes to us from foliage is almost pure white light, sent back by the polished surface of leaves, must not be lost sight of in reasoning upon the effect of interposing more or less coloured media, and it is probable that it would be found to countervail, to a great extent, the benefit which this method would seem to promise.

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VARIOUS MODES OF WASHING PRINTS.

BY PROFESSOR TOWLER.*

The object of washing photographic prints, after toning and fixing, is to remove as much as possible of hyposulphite of soda remaining in the texture of the paper; for the pictures cannot be considered permanent as long as any of this salt remains in the paper, owing to the fact that hyposulphite of soda is easily reduced, whereby sulphur or hydrosulphuric acid are produced, which then act upon the silver film in the prints in the same manner as the sulphur in a boiled egg acts upon a polished silver teaspoon when left for some time in contact with the yolk.

It is a difficult problem to remove every trace of this salt from prints; probably the same difficulty exists in reference to the removal of any other soluble salt with which the textile fabric of paper may be impregnated; but other salts, not being so pernicious to the permanency of the print, have not claimed our attention, and thus we know but little of their comparative affinity for lignine or cellulose.

We propose in the following article, in the first place, briefly to describe some of the various methods used for washing prints, in order to remove as much as possible of the hyposulphite from the texture of the paper; and, secondly, to make the reader acquainted with chemical tests by which the presence of hyposulphite of soda can easily be manifested.

First Method.—The prints after fixing are allowed to drain for a moment or two and thrown into a large tub or pail of water, where they remain until all the photographs of the day have been fixed. From this vessel they are taken and immersed in another containing fresh water. The operation is repeated several times, and the prints meanwhile are kept in motion as much as possible, in order that the washing may be as effectual as possible. Finally, the photographs are left in a large vessel of clean water over night, or ten or twelve hours; they are then taken out, hung up, and dried.

This primitive mode of washing prints is practised now only in galleries where the supply of water is scanty and the amount of business small. It occupies considerable time and labour, and the hyposulphite of soda is not sufficiently removed by the operation.

Second Method.—After the prints have passed through several changes of water, as in the preceding method, they are immersed in a vessel containing a dilute solution of salt. This solution is said, by some superior affinity for the picture or texture of the paper, to expel the solution of the hyposulphite, and thus to take its place. From this saline solution the prints are removed to a vessel of fresh water, where they are again washed in order to remove the chloride. Traces of the latter salt in the prints are said not to be deleterious to the permanency of the picture, and hence the prints do not need the same amount of washing which they require without this immersion in the solution of salt.

Third Method.—The third method, in its most improved form, consists in placing the prints immediately in a running, but intermitting, stream of water, and so arranged as not to accumulate in heaps by the reciprocating ebb and flow. We will describe, as nearly as we can, the washing apparatus of one of our friends in the city of Albany, who carries on a very extensive system of printing for several houses in New York and elsewhere. Mr. Haines, the acting manager of the department, permitted us to take notes of the whole operation.

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* From the *American Journal of Photography.*

* From *Humphrey's Journal.*

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In the first place, at one end of the washing-room there is constructed a large rectangular tank, some eight or nine feet long, two feet deep, and three feet wide. The tank is divided by a transverse septum into two chambers; but the septum is perforated and open at the bottom, so that water can flow from one chamber into the other. Six or eight frames of wood, of inch stuff, are constructed for each chamber, fitting into it and easily secured in position by means of wedges of either metal or wood. Each frame is crossed longitudinally and transversely with copper wire in parallel lines, thus forming a sort of sieve, such as is used for a winnowing machine. The meshes of the sieve are about half an inch square. The first frame is placed on the bottom of the chamber or division to which it corresponds and covered with a layer of prints; a second frame is then let down and covered in like manner; and thus each frame is let down and covered until the six or eight are covered with prints. This appendage of frames is finally secured in its position by means of the wedges, etc., just alluded to. The second division is arranged and filled in a similar manner with the fixed prints.

Water is now turned on and allowed to fill the tank to a height an inch or so above the highest layer of prints, when it overflows the upper bend of a syphon, whose shorter arm reaches to the bottom of the tank, and whose longer arm connects with the sink pipe that carries away all refuse solutions. The syphon is larger in bore than the feeding pipe, and empties the tank in eight or ten minutes; the tank is filled again in about a quarter of an hour, sometimes more and sometimes less, according to the amount of pressure at the waterworks.

By the means just mentioned there is a continual current of fresh water passing up and down through the prints, and this current can be kept in operation for an indefinite time. Owing to the up and down current and the single layer on each wire sieve, the prints are not displaced laterally, so as to clog together or accumulate at one end; nor is there any possibility of the syphon being stopped up by the prints by reason of the wire divisions and their frames, which prevent all communication to the entrance of the syphon to everything except water.

Another important advantage of this washing apparatus is that which, during each intermission of filling, allows the prints to drain for a minute or two. By this means almost every trace of the fixing salt is removed at a comparatively small amount of labour and expense. For a practical photographer this arrangement appears to us to possess advantages superior to those of any other, at least advantages when compared with actual expenditure of cost and motive power.

Fourth Method.—The following method, like the preceding, requires a running stream of water and a syphon. It also requires a rectangular tank divided by a transverse septum. The tank is supported on an axis in the middle, which allows it to lie horizontally when empty of water. The supply-pipe is placed right in the middle between the two divisions and a few inches above the middle septum. Each division has a syphon which begins to empty the water when it has risen to a certain height. Supposing that one side of the tank is full of water, whilst the other is empty, it is evident this side will sink like one side of a see-saw or of a balance; it is allowed to sink, however, only to a certain distance. By this sinking it will be seen that the supply-pipe now pours its water into the empty chamber, and will continue to do so until this side preponderates and sinks like the preceding. The moment one side sinks, the syphon at this end begins to play, and empties a certain quantity of water, until the opposite side preponderates and is emptied in like manner. Hanbury's washing machine is constructed upon this principle, and so is the one we used ourselves before Hanbury's was ever heard of. The first appearance in print of a washing machine of this nature occurred in the *Photographisches Archiv;* but our idea was derived from an engraved plate of mechanical motions published some thirty years ago in Manchester, England, by an engineer whose name was Nicholson.

This apparatus is self-acting, but it is defective in several points which need not be here described. Even with the aid of grids or sieves it would still be defective, and is far inferior to the one described in method No. 3.

Fifth Method.—The next machine for washing prints is the invention of Dr. W. Reissig, and a description of it appeared, June 1st, in the *Photographisches Archiv.* This apparatus resembles its prototype for washing linen, which we recollect having seen many years ago either in the Adelaide Gallery or in the Polytechnic Institute in London, and by means of which linen was washed and dried in a few minutes. The drying part is the most important point in the machine; it is effected by means of what is termed *centrifugal force.*

An axis is put in rapid motion by means of a wheel and cord or by means of a large and a small toothed wheel. Upon the axis is fixed firmly a rectangular frame or wing covered with copper wire transversely and longitudinally so as to form a sort of net or sieve. Another and similar frame closes by means of inches or otherwise upon the former like two leaves of a book, and in this position can be firmly clamped. The prints from which the hyposulphite is to be removed are placed upon the first wire sieve in a single layer; the cover is then brought down upon them and clamped. The prints thus are kept in their place by means of the two layers of wire gauze. They are now moistened with pure water, and, by turning the winch of the large wheel, the frame holding the prints is made to revolve with any amount of circular motion. The moisture in the prints, which naturally contains a portion of the hyposulphite, is driven off at each revolution by means of the air against which the prints are made to strike, and by which their pores are penetrated. In a minute or two the prints are dry. The operation of moistening and of submitting them to the centrifugal force is repeated a number of times, when the prints will be found more perfectly free from hyposulphite of soda than they have ever yet been freed by any other means.

In the Photographic News, Sept. 8th, 1865, we find the patented description of Grisdale's Improved Washing Apparatus, which is evidently very similar to that described and invented by Dr. Reissig. It is, however, an improvement, because it is so constructed as to allow the drum or wing of the cylinder to dip into water when required, by means of which the moistening part of the operation is made more easy. As we before remarked, this sort of machine will free the print more effectually from hyposulphite than any other known contrivance; and yet it is not the machine we would recommend for a large establishment where a thousand prints or more have to be washed every day. The apparatus is ingenious but not—suited for practical men.

We do not think it necessary to describe the thousand and one hobbies of some of our numerous subscribers, because the rest would be jealous and stop their subscriptions, however much they might be improved by the process; we shall, therefore, proceed at once to the second part of our discourse.

Dr. Reissig proposes to show the presence of hyposulphite of soda, even in very minute quantities, by means of a galvanic battery. For instance, a current of electricity is made to pass through pure water in a test glass, and sufficiently powerful to decompose the water. As soon as the battery is in order, some of the drainings from the prints are poured into the test glass instead of pure water, and the two poles are introduced (the two poles may be polished copper wires). The water is immediately decomposed, and at the same time the hyposulphite of soda is decomposed, the sulphur thus liberated combines with the copper electrode, which it affects, and forms sulphide of copper. This sulphide becomes visible as a brownish breath or film on the wire. Dr. Reissig states that one part of hyposulphite of soda in one million parts of water can thus be easily and quickly distinguished.

A washed print may be introduced into the test glass instead of the drainings. If no brownish film is produced, the print is pronounced free from the fixing salt.

A second method, which requires, however, much longer time for its performance, consists in placing at the bottom of a test glass a few small pieces of pure zinc, and then pouring upon the zinc one part of sulphuric acid and ten or twelve of water. Hydrogen gas will thus be liberated. Now mix with the solution some of the drainings from the prints; if they contain hyposulphite of soda, this salt will be decomposed and its sulphur will combine with the hydrogen and form hydrosulphuric acid.

Previous to making this experiment, a piece of filtering paper is dipped in a solution of acetate of lead or of subacetate of lead (sugar of lead). This paper is placed over the top or opening of the test glass, and is pressed down so as to close the orifice, and is left for a quarter of an hour or more; if, after the expiration of this time, the paper does not become in the least stained with a metallic film, there is reason to believe that no hyposulphite of soda was present in the drainings, and that consequently the prints have been sufficiently washed.

The third method which we shall describe is one proposed by our esteemed co-labourer, Mr. Carey Lea, and appears in many instances superior to the two preceding methods.

Most of the printing paper is sized with starch, and, when this is the case, the presence of hyposulphite of soda in such paper is determined as follows :—

Add a drop of tincture of iodine to an ounce of water, which assumes a wine colour. Dip a fine camel's-hair pencil, or the point of a fine pen made from a quill, and make a mark with it on the printing paper before it has been sensitized. A purple line is produced if the paper has been sized with starch.

Repeat this experiment on the dry print after it (the latter) has been fixed. If the purple line again appears and remains, it is an indication that the print has been carefully and sufficiently fixed; for, if there were any trace of hyposulphite in the print, the purple line would either not appear at all, or, if it did, it would immediately be dissolved or bleached by this salt.

Of course this test can be applied only to those papers which contain starch.

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Proceedings of Societies.

North London Photographic Association.

The usual monthly meeting of this Association was held on the evening of Wednesday, November 1st, Mr. W. W. King in the chair. The minutes of a former meeting having been read and confirmed, Mr. Smith (of Negretti and Zambra's, Fleet Street), was elected a member of the Society.

Mr. J. T. Taylor exhibited some examples of Mr. Woodbury's Photo-relief Printing Process, and called attention to the progress which Mr. Woodbury was making.

A desultory conversation thereon followed, in the course of which Mr. Wharton Simpson explained the details of the method of printing employed, and exhibited a very charming example on opal glass so produced, remarking that when a paper equally fine and even in texture as the glass could be obtained, that there would be no difficulty in securing prints on it equalling that shown on glass.

Mr. Taylor showed some of the plates, and also showed a piece of soft, white metal with the perfect impression of a feather, to illustrate how perfectly delicate images might be produced in metal by means of pressure.

The Chairman said it was a most important step in advance that such a process, promising such results, should be discovered, in which not only rapidity of production, but permanency would be secured, and the great want of photographic book illustrations secured.

A short conversation on the new organico-iron developer followed, and Mr. H. Cooper, Jun., stated that he was making very extended experiments, and had already arrived at improved and very satisfactory results, the formula for which would appear in the Society's Journal for the present month. [The details of this formula will appear in our next.]

Mr. Hill asked if anyone knew anything of Mr. Breese's method of working in producing his very exquisite transparencies, and upon what their superiority depended.

Mr. H. P. Robinson said he believed that it was chiefly due to the brains employed in producing them.

Mr. Simpson said that if Mr. Breese were to publish every detail of his operations, it would probably be found that there was little secret in the matter beyond his own taste and skill. Photography abounded with illustrations of the fact that one man would produce with the same materials, formulæ, apparatus, &c.—in short, all the same material appliances—most exquisite pictures, whilst another would produce the merest smudges, without any excellent quality whatever.

The Chairman asked Mr. Ackland to give the meeting some details of his recent modifications of the Fothergill process. Anything which would save them from the troubles of the tannin process and its frequent concomitant, which had been styled "blurring," would confer a great boon on photographers.

Mr. Ackland said that as to the process he had not much to add to what had already been published. He might state that he literally had no failures. There was no tendency to blurring, or to any of the disadvantages of the tannin process.

The Chairman asked if he had met with those troublesome spots so common to tannin plates.

Mr. Ackland said he had met with some spots, but in one instance only, and that arose from a deposit in the acid silver solution, and was removed at once by filtering that solution before it was dropped into the developer.

The Chairman asked if Mr. Ackland found this process more certain than the tannin, in which so much depended on the special quality of the collodion. With the tannin he had been much troubled. He tried collodion from three different makers; in each case the first time the results were satisfactory, but in each case the next sample gave him "blurring." This uncertainty was most perplexing.

Mr. Ackland had tried with his recently published modification of the Fothergill process four samples of collodion all widely purposely differing, and in each instance with satisfactory results.

The Chairman said that one of the advantages claimed for the collodio-albumen process was that it was independent of the character of the collodion.

Mr. Ackland said that this was the case because the picture was really formed on the albumen. In the Fothergill the picture was produced on the collodion, which seemed, however, to be so modified by the solution of albumen, that different qualities of collodion seemed to make little difference in the results.

The Chairman said that a perfect dry process would be a great boon to amateurs, and the simplicity and certainty of this seemed to promise great advantages. He had given the tannin process an extended trial, and had in many respects liked it; but its uncertainty was most troublesome, and his last excursion with tannin plates had upset his faith in them.

The Chairman proposed that an address of congratulation on his release from the hands of the brigands, should be forwarded to Mr. Moens by the Society. This was carried by acclamation.

After some votes of thanks the meeting was adjourned to December the 6th, when the subject of the new organic developer would be introduced again by Mr. Cooper.

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Correspondence.

LONDON IMPROVEMENTS.

Sir,—London of to-day will be "Old London" to the next generation, so rapid and so startling is the metamorphosis unceasingly taking place.

Would it not be well for some clever and enterprising photographer, who desires to hand his name down to posterity, to take a few views of those parts of the metropolis that are about to be demolished, in order that our successors may see what sort of a place this London was in the year of grace 1863?

It is a pity that old Hungerford Market, for instance, was demolished without some heliographic record of it being kept; the same may be said of many other public and private institutions and houses which have been, or shortly will be, swept away by the street improvement mania or railway invasion. Holborn Valley is another case in point.

Posterity will no doubt feel as much interested in the London of 1863 as we do in that of 1663, and there is no reason why they should not have better means of judging its actual condition at the present time than we now have of its appearance two centuries ago. If silver prints will not keep, collodion negatives will.

And this brings me to a suggestion I have often thought of making to you, namely, that the Photographic Society should offer to become the custodians of such negatives, and issue proofs from time to time, on reasonable terms. In the course of time, such a collection would become extremely valuable, and cumulatively so in an antiquarian point of view, and considerably so in a pecuniary sense, a proper catalogue of them being kept.

One illustration will be sufficient to prove this. Suppose we had, for example, at this moment (had it been possible to take them), negatives of the residences and haunts in London of Milton, Shakespeare, and scores of other British worthies, how much would they be worth at the present time? How many disputed points in history might be settled by such records? At this moment the camera might be very usefully employed in delineating the existing condition of the north bank of the Thames between the bridges of Westminster and Southwark, the appearance of which will, in a few years, be totally changed by the embankment now in progress. I am, sir, yours obediently,

F. R. G. S.

Photographic Notes and Queries.

Nitrate of Ammonia in the Printing Bath.

Sir,—In your News of April 1st, 1864, Mr. Barrett complains of some samples of albumenized paper losing the albumen in a nitrate of ammonia bath. I have used one for the last six months with different samples of paper, and have always obtained good results. I prepare it in the following manner:—Take 480 grains of silver and dissolve it in 8 ounces of water; take one third of this, and add to it strong liquor of ammonia until the precipitate is redissolved, taking care not to add it in excess; then add a few drops of nitric acid to every ounce of water, and it is ready for use. I send two copies of the "Trial of Charles I." No. 1 is floated fifteen seconds, No. 2, three minutes.—Yours respectfully,
John White.

[The prints are excellent—Ed.]

The Tannin Process.

Dear Sir,—I have long been a worker of the wet collodion process, but, like many others, amateurs particularly, have been very anxious to adopt some good dry process, and for obvious reasons. I waited till Major Russell's last edition should come out before adopting any. I at once got the book, and have read it all through, including the appendix, with great interest, but I am fairly puzzled with the mass of information. Major Russell would confer a great obligation if he would just select one process, and give us it from beginning to end. For instance, in the preface we are told that the previous coating the plates may now be dispensed with; but throughout the book and appendix it appears to be thought useful or as a modification of it by which the edges of the plates are coated. Then bromo-iodized collodion, and an ordinary neutral bath, is spoken of as giving good results; and afterwards a bromized collodion and an extra strong bath acidified with nitric acid, is spoken of as first-rate. Then washing off the tannin is pointed out as a great improvement. What are we to do? Will you use your influence with Major Russell to take pity on the class to which I belong, a very numerous one, even among photographers, and persuade him to give us the details of one good process from beginning to end. We are amateurs, with little leisure and no time to make trials. I am well aware he says we are to make our own formula; but this takes more time and leisure than we have at command. Yours truly,
Ignoramus.

[We fear that our correspondent's complaint is not without foundation. We shall be happy, however, to give publicity to any concise information Major Russell may be willing to supply in answer to our correspondent's appeal. Notwithstanding our oft expressed appreciation of the Major's indefatigable prosecution of his experiments, we fear it is not his forte to be very concise. In his book he supplies ample materials, which his readers must select. So far as we know, Mr. Hughes's statement of the process is the clearest and simplest we have seen.—Ed.]

The Gelatino Iron Developer.

Sir,—Having seen in the Photographic News some weeks ago, a very simple formula for the gelatino-iron developer, but having myself for some time always used ammonia sulphate in place of proto-sulphate of iron, I made the following modification to suit the double salt:—

Solution 1.—360 grains ammonia sulphate of iron.
9 ozs. water.
Solution 2.— 15 grains gelatine.
1 oz. water.
½ oz. acetic acid.
Mix when dissolved.

I found this developer answer admirably, possessing all the good qualifications I have seen claimed for the organic developer, and producing ample intensity with one application in most cases. It is certainly very much easier to prepare than the developers made with sulphuric acid and ammonia, as described in your last number; and I am much puzzled to know what advantage it is supposed is gained by the addition of sulphuric acid. Will not the organic developer, however admirably it works, if used in landscape photography, have a tendency to bring us back again to white skies? I should be much interested to know if any of your correspondents have been able to produce a really good cloud landscape with it, and whether a sky to print through can generally be obtained in a good negative by means of the gelatino-iron developer.—I am, sir, yours respectfully,
F. H. Ll.

[The chemical combination resulting from the solution of gelatine in acetic acid, is of course altogether different from that formed by the combination of gelatine and sulphuric acid, and the effect on the intensity and colour of the developer essentially different.—Ed.]

Coloured Photographic Enlargements.

Sir,—It seems as if "An Old Photographer" had determined to distort my words on every available occasion into meanings neither meant nor expressed. Whether this be done wilfully or accidentally it most concerns him to say. Although the fact is to me simply an amusing one, it would, perhaps, be well for all parties if this strange writer and those who may credit his statements were put right. By referring to the report in the journal from which your contributor quoted, it will be clearly seen that I did not "modestly" refer to my own productions, but to coloured enlargements generally, when I said that, "aided by photography, even humble and obscure artists might now produce works which" would enable "middle class people to place on their walls," &c. But, after all, those who know what odd things in the way of portraiture were painted for royal personages less than fifty years ago will not consider a very great compliment conveyed, either to myself or any one else, in the remark "An Old Photographer" so very characteristically comments upon.—I am, sir, faithfully yours,
Alfd. H. Wall.

Talk in the Studio.

New Photographic Paper.—Messrs. E. and H. T. Anthony, of New York, call our attention to a novelty in photographic paper, which, if it fulfil the promised conditions, will be a great acquisition to the art. It is stated to have a pure dead white insoluble surface. At present we have seen nothing of it; but as an interesting announcement we give the description with which Messrs. Anthony have favoured us. It is styled "Brinckenhoff's Porcelain Surface Photographic Paper," and the following advantages are claimed for it:—"1. The insolubility of its surface, which allows it to be passed through all the solutions necessary to the production of the photographic image without raising the fibre, which in other papers causes the sinking of the impression into the tissue, rendering it flat and indistinct, and requiring the use of some vehicle, such as gum, gelatine, or varnish, to bring it to the surface. 2. Its extreme purity of tone, whiteness of the lights, depth of the shadows, and delicacy of the half-tints, heretofore unattained on any plain paper, and its possessing all the strength of detail found in albumen paper, without the unpleasant gloss and hardness so much deprecated in all large pictures where albumen is used. 3. The surface, which is a pure dead white, resembling finely-ground porcelain, causes the image to stand out from the background with a stereoscopic effect which contrasts strongly with those made on surfaces that are porous and absorb the impression into the body of the paper. 4. The facility of manipulation, requiring only the ordinary salting solution, ammonia nitrate of silver (30 grains to the oz. of water) brushed over the surface, alkaline gold toning and fresh hypo fixing, to produce the finest effect obtained by the most complicated formulas. 5. The great advantage of allowing the artist to colour the photographs either in oil or water-colour, in less than half the time required on ordinary papers, without the use of any other preparation than that contained in the paper on which the image is made. The surface, though insoluble, is sufficiently absorbent to take in the colour without any loss in force or detail. 6. The susceptibility of a high polish under pressure if it is desired for small pictures that require colouring, such as vignette cards—usually so difficult to produce a good effect upon, owing to the non-absorbent quality of the albumen. These are some of the distinguishing characteristics of the "Porcelain Surface Paper." Other and no less important advantages will be readily seen in the use, such as their freedom from discolouration while drying in the dark room, the permanency of the impression, the short time required in washing, for the reason that the paper, being submerged, the pores are all filled up with the material used in its preparation; hence the sulphide of silver cannot find any lodgment in the tissue of the paper, and fading is prevented, &c., &c." These are the claims, we understand, made by the inventor, and should possibly be taken with a grain of salt, an inventor being very apt to over-estimate the charms of his bantling. We are promised, however, some examples very shortly, when we will report to our readers.

Photography and Archæology.—At the recent meeting of the Wilts Archæological Society, Mr. J. H. Parker, in some remarks on Bishopston Church as a most interesting example of the architecture of the 14th century, suggested to members the propriety of employing good photographers to take views of all the most interesting objects of antiquity in the county. He should like to see other societies follow the same example, as by exchanging these photographic views a great amount of antiquarian and archæological knowledge might be obtained. At present the information on such subjects was locked up in the local archæological journals, which no one ever saw out of their own county. They had a remarkable instance of the want of good photographs of such objects of interest in the church in which they were then assembled. For himself, he would travel fifty miles at any time to see such a valuable specimen of the best period of our ecclesiastical architecture. There could be no doubt that there were many other equally beautiful churches in this country, of the merits of which the public were profoundly ignorant. For himself, he wished that the beauties of Wilts might become known to all England.

Dangers of Cyanide.—A correspondent, who signs himself "One who has been twice bitten by cyanide," writes: "Pray make it known that a warm saturated solution of hyposulphite of soda will clear a plate as quickly as an ordinary cyanide-bath." A warm solution of hyposulphite would be somewhat inconvenient for general use; but a cold saturated solution presents no difficulties and is perfectly efficient, and if its action be a little less rapid than that of cyanide, there is no danger of the half tones of the negatives suffering, to say nothing of the operator's health. If the hyposulphite solution be kept in a dipping bath, one negative will be fixed by the time another is ready for immersion.

Mr. Swan's Carbon Process.—We understand that Mr. Swan has received a medal at the Photographic Exhibition at Courtrai, for his magnificent carbon prints, which are considered to surpass anything hitherto produced in that direction.

Civic Portraiture.—We notice in a provincial paper the report of an application to the Town Council, from a local photographer, to be permitted to obtain portraits of each member for publication. What an interesting addition to local histories may thus be secured!

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To Correspondents.

An Exhibitor.—We regret that the final days and close of the North Eastern Exhibition were much less satisfactory than might have been desired. From what causes we cannot undertake to say, the Exhibition was not successful in a pecuniary point of view, and the general committee, anxious, if possible, to redeem past loss, introduced an entertainment which, however laudable in its proper place, did not accord or harmonize with the original purpose of the exhibition. Many contributors became disgusted, and took their goods away before the close. We have heard that there were divided councils amongst the management, and the final arrangements were irregularly and irresponsibly managed. The North London Photographic Committee had no control over any of these things. It was understood and announced at the outset that exhibitors requiring table space or fitting would be charged the cost of such fittings, but we were not aware that any charge was contemplated for exhibitors requiring wall space. Who is responsible for making the small charge to each exhibitor we cannot tell you; but we presume that a great loss having been incurred, in this charge an effort is being made to retrieve the position in some degree. Your other grievances are evidently just cause of complaint, and we regret deeply their occurrence, but cannot, unfortunately, suggest any remedy.

A Painter.—The best mode of keeping a printing-bath up to working strength, especially when it contains foreign matter in the shape of gelatine, nitrate of soda, &c., is to keep an account of the quantity of paper excited on it, and observe at the same time the results which indicate impoverishment of silver. In Mr. Blanchard's "Chapter on Printing," in our Year-Book for 1864, he states that using a forty-grain bath, his practice is to add an ounce of nitrate of silver for each quire of paper floated, and sufficient water, generally about ten ounces, to make up the original quantity of solution. Such a rule will be found an excellent one, but, of course, a little judgment must be used in applying it, as some samples of paper, being more heavily salted, will abstract more silver from the bath than others.

A Chip writes to suggest a co-operative act of charity amongst photographers. He has observed that the Commercial Travellers have recently presented a lifeboat to the Lifeboat Institution, and he thinks that as sailors are, when ashore, generally liberal customers to the professional photographers, it would be a graceful act on the part of photographers to subscribe for the building of a Photographers' Lifeboat. We give his idea publicity, and may add that it would afford us much pleasure to see such an idea put into practice. We regret, however, that our own immediate duties are so numerous and onerous, that we could not possibly take action in organizing such a movement, or taking charge of subscriptions ourselves. That is a duty which, if done at all, must be performed by those who have occasional leisure—which we very rarely have.

Farewell.—Collodio-chloride of silver should be of a milky white colour, translucent, and free from turbidity. 2. For sitting figures we prefer a very slight tilting of the camera.

F. Sisson.—So far as we know any gelatine may be used; but each person, in stating his experience, will naturally mention that which he has found successful. As samples of gelatine differ, a little judgment will be necessary in their use, and when a solution is rendered too thick or viscous by using the prescribed proportion of some given sample, the quantity must be reduced.

Aspirant.—We have not yet tried the silver bath with gelatine, but hope to do so shortly. The specimens forwarded to us as illustrating the results, both by the "Photographer's Assistant," and by Mr. Palmer, are most excellent examples of printing. 2. A solution of protosulphate of iron does not keep unless it is very securely preserved from the action of the atmosphere. A strong solution in a well-corked bottle, the bottle being inverted so as to rest on the cork, will keep; but if the atmosphere come into contact with it, oxygen is absorbed, and the proto-salt is changed into a per-salt which has no developing properties.

P. A. Monnichendam.—We shall have pleasure in examining a specimen of your work on enlargements.

W. W. S.—We should hardly have accounted for the spots as you do. But if you are satisfied that they arise from drops of the nitrate solution accumulating and standing on the plate during exposure, the remedy may be found in one or two things. When the solution so accumulates it is generally either because the collodion is excessively horny and repellant, or because the plate has been removed from the bath too soon. The remedy in the latter case is simple. If the evil arise from the collodion being repellant, the only remedy at times consists in using another sample; but sometimes it will be found that this addition of a drop of distilled water to each ounce of collodion will effect a cure, the film being sometimes repellant to water in consequence of anhydrous solvents having been used in its manufacture.

Nominis Umbra.—In the intensifier to which you refer, a drachm of a solution containing one ounce of bichloride of mercury and one ounce of hydrochlorate of ammonia in a pint of water is added to an ounce of water, and to this is added a drachm of a solution containing one grain of chloride of gold in one drachm of water. The details appear in the Photographic News, September 15th.

H. J. C. Andrews.—The honey we used was procured from the family grocer for table use, and, although fine honey, had not, we presume, been subjected to any process of refinement. The proportion mentioned was ascertained by weight, and the usual treatment was adopted. We cannot account for the results you obtained; nor have we, as yet, tried any other than the sample described. We shall be glad to learn if the same results follow further trial. 2. It is not necessary to use cyanide of potassium for fixing either negatives or positives. Cyanide has been frequently recommended in preference to hyposulphite for fixing collodion positives for two reasons: the lights were left of a somewhat purer white, and cyanide was more easily washed away from the film than hyposulphite. The latter may be used in fixing positives by the alabastrine process, but the film must be very thoroughly washed before the alabastrine solution be applied.

Several Correspondents in our next.

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Photographs Registered during the Past Week.

Mr. Thos. Tyley, Bristol,
Photograph of John Pym, Esq.
Mr. John Budd, Dunstable,
Photograph of the Priory Church, Dunstable.
Messrs. W. & D. Downey, 9, Eldon Square, Newcastle-on-Tyne,
Photograph of the Rev. Newman Hall.
Mr. E. Harrison, Newcastle, Staffordshire,
Two Portraits of Rev. F. Hoare.
Mr. Henry Bealon, Bradford,
Two Portraits of Rev. S. G. Green,
Portrait of Bishop Westerby.

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COLLODIO-CHLORIDE OF SILVER FOR OPAL GLASS.—FURTHER HINTS.

The use of collodio-chloride of silver has become decidedly more popular for printing on opal glass than it has for producing paper pictures, although we have received from time to time some admirable examples of its application to the latter purpose. It is easy to understand, however, that its most favourite application would be to opal glass printing, as in that process it produced a better result and by simpler means than any other method practised, and enabled photographers very easily to introduce a taking novelty to the public.

The formula we published about six months ago* has continued to give us excellent results, and both the sample of collodio-chloride we then made, and that furnished to us a little earlier by Messrs. Mawson and Swan, have remained in good working condition, without apparent change, up to the present time. From numerous enquiries we find, however, that many photographers are desirous of possessing a formula whereby they may prepare collodio-chloride of silver for themselves without being under the necessity of testing various samples of pyroxyline, ether, alcohol, &c., but instead, taking some of the plain collodions and adding the requisite salts for themselves. This is a method in which we anticipated some difficulty; and until recently we gave but little attention to it. The chief difficulty arose out of the fact that plain collodion is rarely sent out which will bear more than one part in four of alcohol added to it, and in that proportion of alcohol it would not be easy to dissolve the due proportions of the sensitive salts. Another difficulty was suggested by the fact that in our experience a collodion having somewhat more body than that prepared for producing negatives was desirable in printing.

These difficulties, however, turn out to be less troublesome in fact than we at first anticipated, and by some of our readers have been completely overcome. A few weeks ago Mr. Britton, of Barnstaple, called upon us for the double purpose of thanking us for what he regarded as a great boon, and of showing us some of the results in applying it. They consisted of a series of very delicate and charming pictures on opal glass, the collodio-chloride for which he had himself prepared from plain negative collodion. The formula he had worked out was as follows:—Three stock solutions were prepared—

No. 1.—Nitrate of silver	... ...	1 drachm
Distilled water	... ...	1 „
No. 2.—Chloride of calcium	... ...	16 grains
Alcohol	... ...	1 ounce.
No. 3.—Citric acid	... ...	16 grains
Alcohol	... ...	1 ounce.

To one ounce of plain collodion the following proportions of these stock solutions were added: nine minims of No. 1 were added to a drachm of alcohol, and this added to the collodion, which was then well shaken. Then of No. 2 and No. 3 solutions a drachm each was added, which when shaken and the combination completed formed the sensitive preparation. This they found to answer perfectly, and the results we saw very admirably bore out the excellence of the formula.

We have, during the last week or two, been testing a formula very slightly differing from that just stated, and with the most successful results. In preparing a formula with materials to be obtained commercially we took the cheapest in the market. The plain collodion we used was that supplied by the United Association of Photography for the Wothlytype process, and sold at three shillings and sixpence per pound. For the collodio-chloride process it was excellent, giving a film of fine texture, even after an unusual proportion of water had been added with the nitrate of silver, and drying perfectly bright and transparent without the slightest opalescence or opacity. In adding nitrate of silver we tested it severely by adding more water than was absolutely necessary; having a solution at hand containing one drachm of nitrate of silver in two drachms of water, we added sixteen minims to each ounce of plain collodion. To this, after agitation, we added to each ounce a drachm of a sixteen-grain alcoholic solution of chloride of strontium, and then added to the whole at the rate of one grain per ounce of citric acid in powder. Within five minutes after this was mixed we coated a piece of paper which yielded a very excellent print. On opal glass it worked still better, printing rapidly and giving great vigour. Notwithstanding the free addition of water the texture of the collodion was in no appreciable degree injured, the result being satisfactory in all respects.

So far as we have seen to the present moment no printing-frame has been made which comprises all the advantages which are desirable; the best being confined to one size of negative, and lacking facilities for the use of opal glasses of various smaller sizes than the negative. When we were in Dublin, a few months ago, visiting the International Exhibition, we saw at the establishment of Messrs. Millard and Robinson some very fine collodio-chloride prints on opal glass, and Mr. Robinson called our attention to a very simple and efficient contrivance for examining the progress of printing on opal glass where an ordinary pressure-frame was employed; but this was only available where the negative was larger than was required in the print, a very common circumstance with such pictures. The plan consisted in cementing a thin strip of glass on to the portion of the negative not required, so as to form a shoulder. When the sensitive plate was ready it was placed on the negative, one edge being placed firmly against the shoulder formed by the strip of glass; a piece of gummed paper was then moistened and pressed upon the back of the opal glass and on the strip of glass cemented on the negative. The whole was then put into an ordinary printing-frame. It will be seen that when it was necessary to examine the progress of printing the opal glass could be raised and returned again without altering the position in the slightest, as by keeping the opal glass pressed against the shoulder referred to it was prevented from slipping or moving lengthwise, whilst a broad piece of gummed paper effectually prevented any lateral movement. Mr. Robinson employed opal glass chiefly for miniatures for bracelets, lockets, &c., finishing them by cementing a piece of white glass to the surface of the print, at once improving the appearance and the security of the picture.

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* See Photographic News, May 12th.

On another page we give several modifications of our process proposed by American photographers, but which we have not yet ourselves tried. It will be noticed that in all these a preliminary coating of some kind is recommended. In our practice we have not found this necessary. The plan of treating about one-eighth of an inch of the margin of the glass with dilute albumen we found in all cases to retain the film firmly attached to the plate. Several of our correspondents have not found this in all cases efficient, and Mr. Robinson, of Dublin, mentioned that, instead of applying any coating to the edges of the glass before pouring on the collodio-chloride, he applied a solution of wax to the edges after printing, and before immersion in water, or the toning bath after printing. This he found answered perfectly; and we have since employed a spirit varnish satisfactorily the same way.

Another of the difficulties experienced by some has been the rapid tendency to over-tone, the prints being blue or slaty almost as soon as they were immersed in the toning bath. To avoid this difficulty, we can only repeat that a very weak and old acetate bath will answer best; and if it be necessary at any time to make a new bath, one containing a grain of chloride of gold in a pint of water, without alkali, would probably be found to answer. Unlike paper prints, which generally lose a little depth of tone in the hypo bath, collodio-chloride prints generally become somewhat deeper in the fixing bath. If the film be washed or moistened under a tap previous to toning, care should be taken to avoid air bubbles forming and protecting some portions of the film from being moistened, which will produce spots in the finished print.

We have heard in one or two instances of the films splitting after drying the finished picture. We have not met with such a difficulty; but it can only arise, so far as we see, from the use of either an imperfectly-cleaned or damp plate, or from the use of an over-contractile collodion.

Where more vigour is required, the easiest plan to obtain it consists in the adding of a little more pyroxyline to the collodio-chloride; or a similar end may be obtained by slightly warming the opal glass, and coating it somewhat deliberately so as to secure a thick film.

ON THE IMPORTANCE OF ART CULTURE TO PHOTOGRAPHERS.

BY VALENTINE BLANCHARD.*

Wholesome castigation judiciously administered should be productive of some good, and, therefore, at the breaking up of our photographic school for the midsummer holidays, we received a warming all round, but though sharply applied, and dealt out unsparingly to all alike, yet, on the whole, it was well-merited; therefore it is right that at the commencement of this session we should show that we are the better for its infliction.

Now, to start with, it is undoubtedly true that photographers, as a body, have given but little attention to art culture, the importance of which to all who desire to rank as artists, no matter in what department of art, no one, not even the most egotistical amongst us, would attempt for an instant to deny. It is, therefore, my desire this evening to place before you a few thoughts which have grown out of the suggestions thrown out by me, at the annual meeting, on the desirability of forming an art library in connection with the South London Society. And, to begin with, let us briefly review the first efforts of the juvenile art student, for the individual experience of the embryo artist may be taken as a type of the progress of all arts, and photography amongst the number.

The first efforts of the very young artist are slow, for they are barred at nearly every step by almost insuperable obstacles. The trembling and uncertain hand essays in vain to produce the straight line, and after repeated failures the ruler is called into requisition to smooth away the difficulties. But after a time comes complacency, and then follows, apparently with no effort, an almost inexhaustible series,—wonderful frigates adorned with colours that completely exhaust the resources of the birth-day colour-box; ships possessing sailing properties that completely overrules the contrarieties of wind and tide; animals whose locomotive powers are altogether original; and trees, the like of which could not be found even after ransacking the four quarters of the globe. This fertility of resource extends over a long period, and then comes a collapse. The yearning after knowledge brings with it misery. The eyes are opened, and the old productions are looked upon with disgust instead of admiration. This is just the period when wholesome training is needed, in order to make the artist. The writings, and, more than all, the examples of the great veterans in art, exert their influence on the mind of the student, for an examination of their works shows the plans and technicalities forced upon them by their necessities, and the shortcomings of all human methods of interpreting the inexhaustible wonders of nature, and then, too frequently—arising out of the depth of reverence for the great teacher—there follows a period of servile adherence to the rules which age has made venerable, the more especially as in the schools the art canons are held as almost infallible, and thus rule, precedent, and method, instead of being used as means by the way, are ostentatiously displayed as the all in all in art. But with the modest and earnest student this does not last long, for after a while, gathering strength from his labours, he throws away the leading-strings and, instead of accepting the interpretation of others, he dares to interpret nature for himself.

From this moment commences the student's success, for though freed from the fetters, the beneficial influence of his training will be felt constantly. Having once acquired the power of seeing for himself, he will be surprised how wonderfully the capacity of the eye will increase daily, for the brain, though constantly fed by his obedient servant, grows hungry on what it feeds on, and eagerly craves perpetually for more.

There is, however, a great difference between the progress of the artist and that of the photographer. The artist, from the moment when he commences his career in earnest, has before him perpetually the greatest works of the greatest minds. In his comparatively elementary studies he is probably engaged in drawing from a reduced cast of the Clytie or the Venus de Medicis, and thus a double process is going on at the same moment, for whilst he is educating the eye to accurately measure proportions, he is also at the same moment refining his taste by a study of the great works of the master minds of ancient Greece and Rome.

The photographer, on the other hand, after passing through the probationary period, when after much anxiety he produces his first image on the glass or paper, is engaged on nothing which tends gradually to cultivate the eye for the more subtle beauties of nature, but on the contrary, the necessity of acquiring this process and that is constantly leading him away from that which should be his main object, and to which everything else should be subordinate, viz., the most perfect rendering of nature, not only in her every day aspect, but in her rarer and grander moments.

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* Read at the meeting of the South London Photographic Society, Nov 9th, 1865.

Now I do think most earnest photographers have got into the transition stage to which I have before referred. Self-complacency has nearly disappeared. Manipulation yields perfect chemical results with but little difficulty, and yet a great want remains unsatisfied. It requires no great effort on the part of the photographer to secure the outer semblance of nature, but the spirit is, except in very rare cases, absent, and the great question now is this:—Have we reached the limit of our art, and can we go no further, or must we remain at the outer gate, and go on polishing and re-polishing process after process, with no hope beyond?

I firmly believe that there is still a greater future for photography. It is true that colour is shut out from us, but when we remember that the painful labour of years is needed to produce a first-class line engraving, the question comes home strongly to us, have we thus far thrown enough self-denial and earnestness into our labours? We possess such unusual facilities for the perfect rendering of minor details; so much painful labour is spared us, that I do think that with the same amount of thought bestowed by the engraver on his work, and a tenth part of the patience, we should produce something that would be recognised by all as a worthy product of so wonderful a discovery as that of photography.

We have much to encourage us. A few men can be named who have been self-denying, and have, in consequence, produced something worthy of the art. Rejlander's "Two Ways of Life" was a wonderful first attempt at composition in photography, and clearly shows that nothing would be impossible to him did he choose to go on in that direction; and whilst I write Robinson's "Autumn" is before me, and in spite of adverse criticism I say it, after a close examination of the works of many great engravers, that it is the most truthful landscape I have yet seen executed in monochrome.

The question comes, could either of the works I have named have been produced without a very considerable amount of art culture? Undoubtedly not. Here comes in the value of art knowledge. Instead of blindly putting the camera in front of something, and allowing it tamely to do its work and photograph indiscriminately all that came before it, long and earnest thought was necessary before the camera commenced its labours. In the "Two Ways of Life" noble aspirations and ignoble passions had to be pourtrayed and woven together in a connected and dramatic plot. The elaboration of the story having been finally determined on and sketched on paper, then, and not till then, came the photographic difficulties of carrying out. In the case of Robinson's "Autumn" the same course had to be adopted. The sketch was fully made on paper and well thought out before the photographic part was attempted. How much has been achieved by Mr. Robinson in consequence of his art knowledge will be at once apparent on an examination of his "Stoneleigh Park," which is the background of his greater picture "Autumn." Here we have a very sweet bit of English rural scenery and nothing more. But look at the completed picture. The introduction of the foreground with its figures has made all the difference. How much more sympathy we have with the work, and how much more its influence grows on the mind! Our eye mechanically follows the direction in which the maiden looks whose hand is raised to protect the eyes from the glare of the afternoon sun, and we at once feel the influence of the heat, and are fully conscious of the golden shimmering glare which half blots the distant trees, interposing a palpable heated atmosphere between the spectator and the distant thicket, and making the grateful shade of the foreground quite acceptable.

Now the distinctive features in each of the two pictures we have named, and which constitute the main force, and give to each the greatest power, are due to the right use of the art knowledge acquired by the artists we have mentioned. Now hear what a thoughtful writer has said on subjects strictly bearing on our present remarks. Ruskin says:—"Great art dwells on all that is beautiful, but false art omits or changes all that is ugly. Great art accepts Nature as she is, but directs the eyes and thoughts to what is most perfect in her; false art saves itself the trouble of selection by removing or altering whatever it thinks objectionable; the evil results of which proceeding are twofold. First. That beauty deprived of its proper foils and adjuncts ceases to be enjoyed as beauty, just as light deprived of all shadow ceases to be enjoyed as light. A white canvas cannot produce an effect of sunshine; the painter must darken it in some places before he can make it look luminous in others; nor can an uninterrupted succession of beauty produce the true effect of beauty; it must be foiled by inferiority before its own power can be developed. Nature has, for the most part, mingled her inferior and noble elements as she mingles sunshine and shade, giving due use and influence to both; and the painter who chooses to remove shadow perishes in the burning desert he has created. The truly high and beautiful art of Angelico is continually refreshed and strengthened by his frank portraiture of the most ordinary features of his brother monks, and of the recorded peculiarities of ungainly sanctity; but the modern German and Raphaelesque schools lose all honour and nobleness in barber-like admiration of handsome faces, and have in fact no real faith except in straight noses and curled hair. Paul Veronese opposes the dwarf to the soldier and the negress to the queen. Shakespeare places Caliban beside Miranda, and Antolycus beside Perdita; but the vulgar idealist withdraws his beauty to the safety of the saloon, and his innocence to the seclusion of the cloister; he pretends he does this in delicacy of choice and purity of sentiment, while in truth he has neither courage to front the monster, nor wit enough to furnish the knave."

I do think that the time has arrived when photographers would do well to put aside for a time processes, and carefully study the writings and works of painters and art writers, for that little has been done in this direction, except by the few, is at once apparent on an examination of the mass of photographic productions; and the chief characteristic which strikes the eye on looking over a number of photographs, especially if they be portraits, is the almost general absence of taste which they display. Now undoubtedly if photographers were carefully to study the writings of such men as Ruskin, Burnet, Twining, Leslie, and others, there would be opened up to them a new field of thought which would at once bring forth fruit in their photographic productions.

Twining, on the subject of art-knowledge, in his preface says:—"Writers on art who do not confine their views to one particular school or country, but admit its influence as cultivated by different nations, may sometimes contribute effectually to dispel prejudiced, exclusive, and one-sided ideas, for the more art is generalized, the less likely is it to fall into a condition of self-sufficiency which discovers beauties in that method only of interpreting nature to which the eye has been long accustomed, and the mind gradually trained. Its influence will ever become more beneficial in proportion to the extent to which it diffuses kindred tastes and feelings among various nations."

"Doubts have been continually raised as to the expediency of rules and principles as applied to art: but have those who entertain such doubts well considered if there be any cases at all to which rules may be applied, and if so, to what extent they may be made available? Let the question be entered into, and precise limits assigned to the use or withholding of rule, and I believe that few minds at all conversant with art would maintain any further doubts as to the utility, and indeed the occasional necessity, of guiding principles. Even in science, practice is sometimes placed by the ignorant above theory, because practice realizes the immediate and visible result; but without theory, with out the first application of the principles of force and motion, what would practical skill have to act upon, and what results could the greatest manual dexterity produce? Very different, however, are the limits assignable to theory in mechanical sciences and in art. Rules, as it has been generally admitted, are no substitutes for genius. They would never have produced the 'Galatea,' the 'Transfiguration,' or the 'School of Athens.' * * * * Theory, indeed, would be worse than useless in the art of painting were it to claim as its special office to rule inspired thought, and to assert principles of grace in the lively creations of fancy. Its advantages are chiefly shown in correcting errors, and in chastening the productions of those who want penetration and experience necessary to proceed unguided. A more extended knowledge of the principles on which art is founded might not add many to the best of the yearly productions of our artists, though it might diminish immensely the number of the inferior ones. * * * * * * * What do we perceive if we examine the usual course of the progress made by any individual in art. From the earliest—I might say infantine—attempts at drawing, we may trace a change in the ideas entertained with regard to imitation, which is commensurate with the progress of the performer, and which certainly cannot be due to the exercise of the hand alone. The child and the uninstructed in art seem alike to consider it of the greatest importance to omit nothing which they are able to see. Continuity of form appears to them a point of first necessity. A boundary line, studiously even and unbroken, of an object so situated as to afford the fullest view, is deemed the best and most natural expression of it. * * * * * * The third stage in art is that in which sentiment and feeling are the predominating principles. An ingenuous love for the beautiful in Nature here supersedes the happiest results of tuition; and the work of art which so overflows with the sentiment infused into it, that the spectator becomes a necessary sharer in those emotions, is raised to the most honourable station. But it is in this most delicate period of the art that those resources which are the result of long experience and practice are most required. Their deficiency causes the language of inspiration to be intelligible to the performer only, and their neglect converts the brightest images of the fancy into wild and disconnected abortions.

I might go on further, but time will not permit. The importance of art education to photographers, then, being clear and undoubted, the question at once comes:—Cannot we, as a society, do something to aid the good work? Let us act at once, and, as speedily as possible, form an Art-Library in connection with the South London Society. Surely, in times yet to come, when every photographic society shall possess an Art-Library, containing all the standard works of art as well as chemistry, and a complete record of photographic discoveries from the first drawing of the art down to the latest date—surely, when such a time arrives, it will be something for the members of the society to be enable to say "Ours was the society that first introduced art and scientific libraries amongst photographers."

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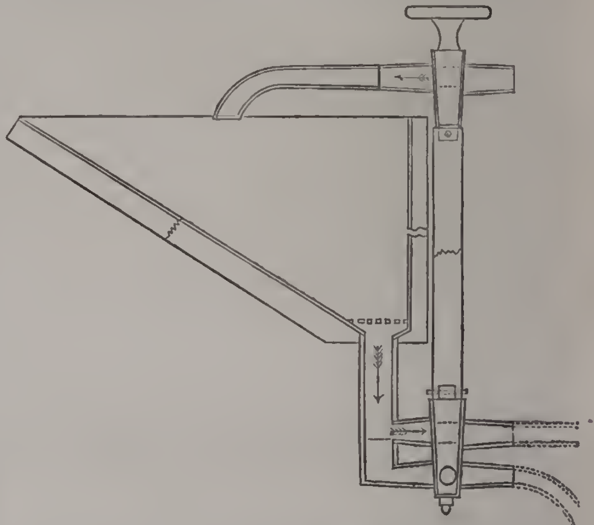
A NEW SINK FOR PHOTOGRAPHERS.

BY J. C. LEAKE.*

I have to introduce to your notice this evening a sink for use in the dark room, which I have designed with a view of saving some of the silver usually lost during the development of negatives.

We will suppose ourselves about to develop a negative in the usual way, over a sink of the ordinary construction. On pouring the iron solution over the plate a certain portion flows over, carrying with it a portion of silver, and, the development being completed, the plate is drained, washed, and the remaining portion of silver retained on the plate from the bath passes down the sink and is lost. In like manner the intensifying solutions of pyrogallic acid and silver and the fixing solutions run away and are lost, a large quantity of silver being thus wasted.

When the photographer has plenty of space the loss may be avoided in various ways. Two sinks may be used; one for developing and fixing, the other for washing the plate. Or he may have a large tank, into which the whole of the solutions, with the water used in washing, may run. This is, of course, the most complete system, as the whole of the silver may be recovered from the solution. But it is not often that, in London, space can be spared for the carrying out of either of these operations. I have, therefore, devised a plan by which I think a large proportion of silver will be saved, while a space no larger than that required for a sink of the old construction will be required.



The sink which I have constructed consists of a box of wood, one side (which when in use forms the back) of which is upright, while the other three slope inwards toward the bottom, forming a sort of square funnel. This is lined with lead in the usual manner. The neck is formed by a piece of lead or brass tubing, about six inches long and one and a-half inch diameter, and which is stopped at the bottom. Into this is inserted a sort of double stopcock, the plug of which is so bored that when *one* tube is open the other is shut. These taps are firmly attached by means of an iron rod to the lower part of the tap used to regulate the supply of water over the sink; and are so arranged that when the water is turned on into the sink that portion of the stopcock leading to the water is turned on also, while that leading to the vessels containing the silver solution is turned off, thus allowing the water used in washing to flow away. The simple act of turning off the water supply at once turning off the escape pipe, and opening that leading to the reservoir containing the solutions, which, of course, remains open until the water is again turned on for washing the plates.

If we now proceed to develop a plate, the overflow of the developing solution at once flows down the tube into the reservoir, and is saved; as is also the solution drained off on the completion of the development. Then the water being turned on, the opening to the reservoir is closed, while that to the waste is opened, and the water flows freely away. For intensifying (and also for fixing, should cyanide be used), the same operation is gone through, and the solutions are thus saved without any trouble or loss of time to the operator.

A sink of this form possesses also the following advantages:—first, there is no splashing, on account of the sloping sides upon which the water falls; and, secondly, that as the sink is kept drained, and is, in fact, washed out in the act of washing each plate, no injurious fumes are likely to arise to cause the ill health of the operator, as in the old form of sink, when the solutions were allowed to mix freely in an open vessel which was never perfectly freed from them.

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* Read at the South London Photographic Society, Nov. 9th.

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ON THE PREPARATION OF THE IRON DEVELOPER SO AS TO PRODUCE DENSE NEGATIVES.

BY JABEZ HUGHES.[*]

The use of photosulphate of iron as a developing agent dates from early photographic times. At the meeting of the British Association in 1844, Mr. Robert Hunt first pointed out its energetic properties for developing latent images on silvered surfaces. It is only more recently that its full services have been recognized.

It is a curious point in photographic history that each process that has been in the ascendant has had its peculiar developer. With Daguerreotype it was the fumes of metallic mercury; with Calotype it was gallic acid; with iodized collodion it was acid pyro; with bromized collodion it appears to be alkaline pyro; and with bromo-iodized collodion it is protosulphate of iron.

In all negative processes it is not enough that a latent image be developed, but a certain amount of density must be produced to render it useful. In most processes this density is produced simultaneously with the development. It is not so with protosulphate of iron. I do not affirm that negatives *cannot* be produced dense enough for printing, but I only state that, as a rule, with bromo-iodized collodion protosulphate of iron does not, *at once*, produce a dense negative. So general is this experience, that ever since the popular use of iron the photographic mind has been on the alert to discover means to remedy this undoubted want. At one time various substances were proposed to be added to the nitrate of silver solution. These were soon found guilty of the unpardonable sin of "putting the bath out of order," and were accordingly banished. Then the collodion was tampered with, and different materials were introduced into it. The constitution of collodion was found too delicate to admit of the presence of these foreign intruders, and it broke down; and the idea of getting intensity by that means was abandoned. Then came the long array of organic and inorganic additions to the developing solution, as well as other methods to achieve the same end; so that until Mr. Carey Lea a few months since wrote his glowing account of the good doings of a combination of gelatine with protosulphate of iron, we knew of no certain means of conquering the difficulty.

When nearly the right amount of intensity is supplied by the iron in the first instance, the plan of finishing, by giving a little increased density to the high lights by pyrogallic and silver, is a very satisfactory mode of working; but when the original deposit is thin, grey, and metallic, then is felt the shortcomings of the iron developer; for not only does the image require a great addition of strength, but it also unwillingly takes the intensity. Under these conditions the picture requires several applications of the pyro and silver; the image has to be built up; and when the required density is produced, there is usually found a considerable loss of delicacy. The more forcing the image requires to become dense, the less satisfactory is the result. In a well constructed portrait studio, and with skilful manipulation, this defect, the absence of primary intensity, exists in the least degree; but it is chiefly found in working in the open air, where the sky forms a large portion of the picture; or in using samples of collodion containing a large degree of bromide; in copying some kinds of pictures; in using a collodion giving only a thin and blue film; and in using weak nitrate baths.

In short, most persons must have found occasions when the iron developer was inadequate for its work, and, instead of bringing forth a vigorous image, only a shadowy one has been seen. Under such circumstances we feel that an injustice has been done to the primary image by the imperfect agent used to call it forth—as if, so to speak, a good and beautiful latent image was spoiled by the bad bringing up.

I look upon *development* as the most remarkable portion of photography; and in practice, next to the management of light, I think it the most important part of manipulation. It is true daily practice makes it familiar, but in this case, at least, familiarity should but increase the wonder. While this aspect of the subject is present to our minds let us dwell on it; and, as we take the exposed plate from the dark slide, before pouring on the developer, let us ask ourselves what is about to take place. We are about to witness one of the most wonderful things in this wonderful world! A few minutes since a ray of light, associated with countless other rays of light, was deep in the sun's photosphere. With its own directness it darts forth, its destination this earth; onwards and onwards it comes at a speed that our finite faculties, though measuring, can never appreciate. As it approaches our globe it is bent out of its course, here a little and there a little, but onwards it passes till it reaches the smiling face of a happy child, fresh as itself from creation. But its mission is not ended; it but stops to kiss the features it illumines, and, at an angle, onward again it goes through walls of crystal into its mystic chamber. There it stops, and in its own invisible manner depicts the thing of beauty it travelled a hundred million of miles to register.

The marvel is but half complete. *Has* the subtle ray left its impress behind? Is not this plate in the same condition as before exposure in the camera? Can there have been agencies at work so potent as to quite change the nature of the film, and yet so silent and invisible as to leave no apparent evidence behind?

Who will dare say that depicted on that blank surface is an invisible picture of marvellous beauty, or that concealed in that vacant space is a likeness of God's own image? Yet, mark the change! On the filmy surface pour that unthinking, unconscious fluid, and what was but now a vacant blank is an unfolded picture of truth and beauty, such as Nature only can paint, and Man only can admire! Am I not right, then, in saying that the development of a latent image is one of the most wondrous things in this wondrous world?

To return to the more prosaic aspect of development; any one who aids us in understanding its mysterious nature, or in improving its practice, should be warmly greeted, and I think such greeting is due to Mr. Carey Lea, not only for his clever investigations into the nature of the photographic image, but also for the valuable results that have flowed from his introducing gelatine into the iron developer. I am not aware that this gentleman's name has appeared before in the Transactions of this Society, but in acknowledging him as the introducer of the gelatino-iron developer I should like to be allowed to express to him, both as a representative of American Photography and personally, the great gratification that a very large section—I think I should not be wrong if I said the entire community—of English photographers experience by reading his numerous and valuable contributions. We scarcely know which most to admire—his sound practical and theoretical knowledge, his intimate acquaintance with what is going on in all countries (which makes him a cosmopolitan as well as an American photographer), or the amiable and courteous manner in which he invariably expresses himself. I do not know that I compliment American photographers generally, and him in particular, when I say that I think that the mantle that fell from our own Hardwich seems to have descended on to the shoulders of Mr. Carey Lea; for I know no gentleman who, in his various communications, so much reminds me of him whose presence we prized so highly, and whom we were so sorry to lose. Be it Mr. Lea's good fortune long to hold the post of "guide, philosopher, and friend;" and, in that land of fertile intellect, may many more arise to emulate him in advancing our common Art Science.

Next to nitrate of silver, I know of no substance that has engaged so much photographic attention as gelatine. In the beginning it was pressed into the service of photography; and, more or less, through thick and thin, it and photography have stuck together to the present hour. Among its many proposed uses I am not aware that any have suggested its addition to the iron developer till Mr. Carey Lea. It is hazardous, though, to speak of any one as a discoverer or inventor in photography; for the field is so fertile, and the active minds so numerous, that scarce anything is attributed to one, but another is found to have been before him, so that there seems singular point in the old aphorism that "there is nothing new under the sun," in the very science of the sun. Till it be controverted, however, let the assertion remain that this improvement is due to Carey Lea.

Gelatine added to the iron developer seems to act beneficially both mechanically and chemically. By the increased glutinous properties it gives to the solution, it seems to flow more steadily and certainly over the collodion surface, so that, not hesitating or running into irregular lines, it does not cause the stains and markings that it otherwise is prone to. By this means the developer may be poured on more deliberately, and less solution will be required for the plate; the quantity of nitrate of silver thus becomes less diluted; and from this cause it tends to produce a more dense picture. The gelatine acts chemically by restraining the iron from acting with its usual violence, so that the silver, instead of being very quickly deposited, is done so more slowly, and in the ratio of the action of light itself. It also causes the deposited silver, instead of being thin and grey and transparent, to be dense and brown and more opaque. Moreover it has a great tendency to prevent the silver depositing where the light has not acted, thereby keeping all the deepest and faintest shadows very pure; thus relatively increasing the density of the negative.

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[*] Read at the Photographic Society, Nov. 14th.

While I acknowledge that Mr. Lea has done good service in relation to improving the iron developer, I wish also to state my conviction that since his communication other and more simple means have been suggested for acheiving the end.

Two methods in particular have been proposed, the one by Mr. Cherrill, in the Photographic News, and the other by a correspondent of the "British Journal of Photography," who signs "Clericus," which are sufficiently effective, and very easy of preparation.

Mr. H. Cooper has also been early in the field with his method—a variation of Mr. Cherrill's—and also with his contribution of knowledge flowing therefrom—and to what real or imputed improvement in photography does not Mr. Cooper contribute?

Mr. Cherrill's method is well adapted where considerable intensity is required, as there is no difficulty in obtaining any amount whatever. Mix 1 ounce, by measure, of ordinary sulphuric acid with 1 ounce of water; let them cool. Then add 120 grains of gelatine; when dissolved, add a few ounces of water, say 5, and neutralize with ordinary ammonia. Add an ounce of glacial acetic acid, and make up the total quantity to 20 ounces of solution. To form a developer, prepare a 20-grain solution of protosulphate of iron, and add to each ounce from 10 minims to 1 or even 2 drachms of the above sulphuro-gelatine mixture, according to the intensity desired, remembering that the intensity will be just in proportion to the quantity of the mixture added. This, and kindred solutions, I propose to call the "Sulphuro-gelatine" developer.

The next developer is the one I most recommend. It is but a variation of that of "Clericus," and I propose to call it the "Aceto-gelatine" developer:—

Glacial acetic acid	2 ounces
Distilled water	8 "
Nelson's gelatine	120 grains

Mix, dissolve, and filter.

Then add to it—

Distilled water	70 ounces
Protosulphate of iron	2 "

This developing solution keeps well. In cold weather it is apt to gelatinize, but a little warmth sets it all right. This solution flows like oil on the plate, readily mixing with the free nitrate, and has little tendency to form stains and streaks.

The image comes out slowly and steadily, and not with a flash. The high lights, if the exposure be rightly timed, will be found to have nearly or quite the right density by the time to detail is out. If not sufficiently dense when fully developed, the solution may be poured on and off and the density will increase, or a little fresh solution may be taken, to which a few drops of silver have been added, and any amount of intensity may be obtained. The images dry intense and are not much reduced in varnishing.

These solutions admit of great variety of preparation, but whichever be used, I urge persons to take care and not make their negatives too intense. There is such a tendency in that direction, and this form of developer gives great facility.

In a communication I addressed to the *British Journal* on this subject, I expressed a wish for some form of a salt that by simple dissolution, like the protosulphate, would give the desirable intensity. I am pleased to say my wish has been responded to. Mr. Ramsden, of Leeds, has sent me a preparation that seems well calculated to that end. It does not give equal density to the gelatine developer, but it very nearly approaches it. It is certainly an improvement on the usual plain protosulphate, and many persons who desire a moderate increase of density may find in this salt all they desire.

I cannot conclude without recording a few trials I have made of Mr. Wharton Simpson's honey developer. To an ordinary 15-grain protosulphate solution, with 15 minims each of acetic acid and alcohol, I added one drachm (by weight) of honey. The honey was obtained from the nearest druggist. I was very favourably impressed with the density, sofness, and general good quality of the image produced, and I recommend gentlemen experimentally inclined to test this against the gelatine, as, though differing in character of image, they each agree in communicating increased density to the negative, and it is possible the honey may be found quite as efficient as the gelatine, and by some may be preferred.

If I were asked the way to obtain the fullest advantage of these gelatino-developers, I would say, prepare three bottles of solution, A, B, C. Into A put a 15-grain solution of protosulphate of iron, 15 minims per ounce of each glacial, acetic acid, and alcohol. Into B put the aceto-gelatine developer; and into C put a 15-grain solution of protosulphate of iron, and to each ounce of which add 2 or 3 drachms of the sulphuro-gelatine mixture. Contained in these three bottles would be three strengths capable, separately or mixed, of forming every desirable variety of developing solution, from the density of the strongest pyro to the weakness of common iron; and further, suppose B, containing the aceto-gelatine developer, be considered the usual one, then, as the weather or the subject changed, by adding to it a little of A or C, the intensity of the developer is quite under control, and can be weakened or strengthened as desired.

After more than three months' work, in considerable variety of weather and with many different subjects in and out of the studio, I record it as my deliberate conviction that, used with judgment, the addition of gelatine to the iron developer is one of the most valuable discoveries recently made in practical Photography.

IMPROVED FORMULA FOR SOLUTION TO MAKE THE ORGANICO-IRON DEVELOPER.

BY H. COOPER, JUN.

After many experiments I have arranged a formula that is superior, in some respects, to the one given by me at the North London Photographic Meeting on Oct. 4th, 1865, and which was published in a recent number. I do not give this new formula with the idea that it is the best that can be found; but simply as one that can be depended upon, and that is an improvement on those hitherto given.

I have spent, and hope still to spend, a good deal of time in investigating the action of different combinations of gelatine in the developer, and also when applied to other purposes. I have already obtained a number of curious and interesting results, some of which I am sanguine of turning to practical account. I hope shortly to place a record of some of the most important experiments at the disposal of those interested in the improvement of our photographic formula. A few of the advantages of the mode I am about to give can be very briefly enumerated. To begin with: it is easier to prepare, and it appears to me to offer less chance of failure in its production. In the second place: it is more economical than the old formula, there being much less acetic acid used; and this latter is the most expensive ingredient employed. Another recommendation is, that the gelatine solution itself can be easily filtered, as also the finished developer; whereas in my first method the solution I called *number two*, gelatine dissolved in diluted acetic acid, is much too viscid to run through paper; and the developer to which the compound solution has been added is also sometimes difficult to get easily filtered.

I will now describe the mode which, up to the present time, I have found most generally successful for producing the new solution for the organic developer. I must, however, premise that I am indebted to several gentlemen, as well as to works on chemistry, &c., for some suggestions that I have made use of in this formula, and in my other organic preparations for the same purpose: concerning which latter, "more hereafter." To proceed: Soak 3 drachms of good strong gelatine in cold water, until swollen and quite soft; drain off the surplus water and place the gelatine in a stout earthenware or stone jar; pour in 1 oz of commercial concentrated sulphuric acid, and well stir with a glass rod.

Pure acid may be used; but I have found no advantage from doing so, and it is more expensive than the ordinary. The gelatine is immediately dissolved; still I would advise that the solution be allowed to stand for an hour or two before neutralising.

In my next paper I shall enter upon the question of the propriety of thus preparing the solution; which, for want of a better title, I suppose we must call the "sulpho-gelatine." I do not deem it necessary to do so here, as it might only confuse and divert the attention from the plain directions I am endeavouring to give.

After the sulpho-gelatine solution has remained undisturbed for the allotted time, dilute with 4 oz. of water, and then add sufficient liquor ammonia, little by little, stirring meanwhile, to render the solution very faintly alkaline The solution will be found to be very hot, and should be left till cold—the heat being produced by the union of the sulphuric acid and ammonia. Some photographers may find a difficulty in procuring strong aqua-ammoniæ, s.g 880. So if they have only the weaker or ordinary ammonia of the shops, of which I believe the specific gravity is about 980, they need not trouble about the stronger kind, but use the weak, omitting, in this case, the 4 ounces of water which I have directed to be added to the gelatine solution. To avoid all chance of spirting it may be as well to add 1 oz. of water before the ammonia. About 2 fluid ounces of the 880 and 6 oz. of the weaker will be required to effect neutralization. When the solution is cold add ½ oz. glacial acetic acid; filter; and make up with water to 16 oz.

Sometimes a slight milkiness has been apparent after filtration, but it disappeared upon the addition of the extra water. At other times the solution has been quite clear before the dilution; and it is worthy of remark that generally when the milkiness has occurred the finished liquid has been as colourless as water; but that when it has run bright from the filter it has retained a slightly golden tint. The absence or presence of colour does not appear to alter its working properties. To make the developer, dissolve from 25 to 40 grains of protosulphate of iron in an ounce of water, and add from 30 minims to 2 drachms of the solution made as just described. No alcohol is required. I fancy I hear some exclaim: "Why, this is no formula at all for a developer, and it would have been just as well not to have given it." The reason for giving it is to show that the developer consists simply of sulphate of iron, the organic solution, and water. The strength is put down thus vaguely because it must be altered for each person's working. Approximate proportions only can ever be given for the developer, as they necessarily vary with the condition of the bath, collodion, light, lens, and subjects, not to forget the all-important one of temperature.

The manufacture of the gelatine solution is not nearly so awful an affair as it looks on paper; the directions themselves being somewhat lengthy, as they have been made as explicit as possible, so that there may be no chance of failure through misconception of them, even in the hands of those unaccustomed to manipulations of the kind. It may be well to mention that should the sulpho-gelatine solution, *before* neutralization, by any accident get spirted on the hands or face, the part should be immediately washed with cold water and a little very dilute ammonia. Should it be the clothes that are spotted with it, strong ammonia must be applied, and then sponged off with warm water. But by using ordinary care, no accident need happen.

Those who do not like the trouble of making the solution themselves can procure it ready prepared of Messrs. Francis. It has been made very many times in accordance with the formula given, both in large and small quantities, and has never once resulted in failure. I consider it only fair to the photographic public that a formula should be tested many times before giving it as one to be depended upon; and not to do, as has been done, make a single experiment, and because it happened to be successful, fancy that it must always be so, and present the recipe to the world as reliable. On the other hand it is equally unjust to condemn a formula on the adverse result of a solitary trial.

In concluding, I must express the wish that all may be as successful as I have been with the modification described; and I would earnestly recommend those who may be so unfortunate as to fail the first time, to try again, after carefully re-reading the directions. Should success not then attend their efforts, it will give me great pleasure to place any little experience I may possess in the matter at their service.

November 4th, 1865.

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SIMPSON'S COLLODIO-CHLORIDE PROCESS.—THE OPALOTYPE.

BY CHARLES A. SEELY, A.M.*

The collodio-chloride has suddenly become a great favourite. I know many of the veterans in porcelain who abandoned for it, in a day, all their dearly-bought experience in development and albumen process. Some think it is the *ne plus ultra*. As a practical improvement in our art, it is the great event of the year, and perhaps of the decade. It brings within the capacity of ordinary photographers the production of the new and most perfect style of photography. The immediate future of our art is in prints on glass, and this new process will quickly lead us to it.

The collodio-chloride, no doubt, will be improved, and it may be that its original features will be quite obscured, yet it surely is the beginning of a great change, and we must not forget to whom and how we are indebted for it. It is the free gift to the public of G. Wharton Simpson, Editor of the London Photographic News.

It is only within the past two weeks that I have had any experience in working the process, and I have only had the opportunity of repeating the work of others. I might briefly sum up the result by saying that I have fully confirmed the accounts which have appeared in this Journal. But as this article may be read by many who desire a practical description of the process, I proceed to details. I put the process in such a form as I think will generally be ound convenient for use.

It is possible to make the collodio-chloride so that it may be kept in the dark for weeks or months. But that there may be no risk of precipitation of the silver, or other deleterious change, I think it advisable to add the silver to the collodion only a short time before using. The salted collodion and the alcohol solution of silver may without doubt be kept apart, in good condition for years, and being brought together are fit for use in a few minutes.

The Salted Collodion.—Make a collodion after the following formula:—

Ether	8 ounces
Alcohol	5 ,,
Gun cotton	100 to 150 grains
Chloride of strontium ...	32 to 48 ,,

The chloride of strontium may first be dissolved in the alcohol, or may be afterwards added in fine powder. The salted collodion must be allowed rest, till it has become perfectly clear, when it may be decanted for preservation or use.

The Silver Solution is thus made:—

Alcohol	6 ounces
Nitrate of silver	260 grains
Citric acid	30 ,,

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* From the *American Journal of Photography*, of which Mr. Seely is Editor.

The nitrate of silver, before being added to the alcohol, should be finely pulverized, when it will dissolve after vigorous shaking. A drop or two of water may generally be added without detriment, to assist the solution. The citric acid will dissolve readily.

The Collodio-Chloride is a mixture of the salted collodion and alcoholic silver, as follows :—

Salted collodion	6½ ounces
Silver solution	1½ "

The silver solution is poured gradually into the collodion with constant shaking. The collodio-chloride, being sensitive to light, must be kept in the dark.

The glass, after being cleaned, needs (as in the tannin process) to have a preliminary coating of some substance which will secure the adhesion of the film during the fixing and washing. Any one of the many plans used for dry plates will no doubt answer. I understand that in this city a preference is given to a dilute solution of albumen. I have used myself, with satisfactory results, thin solution of rubber in benzine. The collodion is poured on the plate precisely like iodized collodion. After the collodion is "set," the plate is laid to dry in a dark place, free from dust.

In printing, a frame should be used which will press the opal glass in close contact with the negative. Mr. Kuhns, of this city, is manufacturing a frame which answers the purpose admirably. Mr. Simpson's device, described on page 532, vol. vii.* will, however, perform well, and is an excellent substitute for a frame made expressly for the purpose.

The toning and fixing present no serious difficulties. Any one who has skill with paper toning will not fail with the opalotype.

[In a subsequent article on the subject Mr. Seely says] :—

A preliminary coating of the plate to secure the adhesion of the collodion is always advisable, and generally necessary. It is thought by some, also, that a coating of albumen improves the tone and increases the vigour of the picture. The best coating is probably albumen diluted and thoroughly beat up with three parts of water.

Some have found a difficulty in dissolving a sufficient quantity of chloride of strontium in the collodion. With the right kind of gun cotton for the collodion, no harm will be found in dissolving the chloride in a small quantity of water, before adding it to the collodion. There are, however, other chlorides which are quite as suitable, and readily dissolve without water. Some of these are the chlorides of cadmium, calcium, magnesium, lithium, &c.

The citric acid should not be added to the salted collodion or to the silver solution till the operator is ready to make his collodio-chloride complete for use. Citric acid reacts on nitrate of silver, producing a precipitate. Perhaps the best way is to add the citric acid to the collodio-chloride as the last ingredient.

Some have recommended to use in the collodio-chloride castor oil, to the amount of a grain or two to the ounce.

[The same journal contains several communications on the use of collodio-chloride from American photographers who have tried it. The following is from Mr. Huston, of New York, whom the Editor mentions as one of the highest authorities on opal pictures] :—

"Mr. Editor,—In your journal (July 1st) there is an article by Mr. Sutton in favour of Development Printing upon Opal Glass. Having tried every process which came under my observation, I have found everything to be in favour of direct printing by contact, whether by the albumen, collodio-albumen, or collodio-chloride process. Where the negative is one suitable for development printing, a very good picture may be made by that process; but unless it is so, it is impossible to get as good a print as by direct printing. The collodio-chloride process, which has been published in your journal by Mr. Simpson, has, with some modifications of my own, produced very satisfactory results ; and, taking it all in all, I believe it to be the most reliable of any. Dr. Divine, in his article on the durability of photographs, says it is 'difficult to make the opalotype a pleasing picture without elaborate colouring.' I humbly beg leave to differ with him, as I can show by some of my work, which would only be spoiled instead of improved by the artist's pencil. As regards the collodio-chloride process for paper, I have not yet been able to get a uniformly satisfactory result, but do not yet despair. I am glad to see by your last number that you have again been experimenting in this line, and hope soon to have the benefit of your experience."

[Another correspondent, Mr. W. J. Kuhns, sends a formula, accompanied by an opal picture produced by it, which the Editor pronounces one of the very best pictures he had ever seen. The modification is as follows] :—

"I have made a modification of the collodio-chloride process of Mr. Simpson, which appears, by all the tests I have been able to make of it, a substantial improvement. I obtain with it all the admirable effects of the simple collodio-chloride, with more certainty and ease.

"The preliminary coating of the plate is composed of :

Albumen	1 ounce
Water	3 ounces.

"The collodion is made up of the following ingredients :

Plain collodion	1 ounce
Chloride of cadmium	3 grains
Nitrate of silver	4 "
Nitrate of uranium	3 "
Citric acid	1 "

"The ingredients are got into the collodion in the manner recommended by Mr. Simpson ; a part of the alcohol of the plain collodion is reserved for the solution of the nitrate of silver and cadmium. The chloride of cadmium is first dissolved (no water is needed) in the collodion, and then the solution of silver and uranium, and finally the citric acid.

"I think it is the duty of all those who are desirous to see photography progress, to assist the efforts of the photographic journals in suppressing the prevalent nuisance of process peddling. I agree with the Editor in observing that the fact that a man has a secret to sell is evidence that he knows less than others."

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HINTS ON BLISTERS, GELATINE IN THE PRINTING BATH, &c.

[We select some interesting paragraphs from an interesting letter just received from our able correspondent, the "Photographer's Assistant," giving hints on various subjects connected with printing.]

The hint I threw out to "Quarto" I have not practically tested, but nevertheless hope that it will enable him to stem the tide of his present troubles. First, I would suggest that the prints be submitted to the action of a warm bath for the space of half an hour or more before toning. Should this prove a non-preventative, immerse the prints after toning in a weak hypo solution, previous to finishing in a fixing bath of the usual strength. I advise these modes of treatment for the following reason : blisters are caused by the sudden action of the hypo as it permeates the albumen, thus causing expansion in those parts that have but a feeble hold on the paper, which circumstance occurs in Rive more frequently than in Saxe papers, because the former is less permeable, by reason of its harder surface. The first remedy suggested would probably cause the expansion to be gently progressive, and the last would tend to produce similar results. "A man, when in proper position, might resist the steadily applied strength of a horse, but a sudden jerk would render him helpless, pull he never so stoutly."

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* This consisted in attaching the opal glass to the hinged back of the printing-frame with cement, so that when lifted up the print might be examined and would fall exactly on to the same place on the negative when again lowered.

Should the remedies advised prove unsuccessful, I shall esteem it a favour if "Quarto" will forward to the office of the News a sample of the refractory paper.

I sincerely regret that Mr. Palmer should for a moment have entertained the thought that my remarks on his process as first offered, were prompted by feelings of jealousy. In writing on photographic matters I have no personal interest to serve; but being persuaded that when improvement is the desired object, the surest road by which it is reached is that of hearty honest co-operation. In the case just mentioned I simply stated that the formula was too complex for general purposes, and I am glad to find that Mr. Palmer has arrived at a similar conclusion, so that we can now shake hands and jog on in harmony together. And I am now led to observe that the strength of gelatine given in my formula will not allow the solution to flow readily through the filter paper, but I find that a piece of fine muslin answers the purpose admirably.

The bubbles spoken of by Mr. Palmer from no impediment if a strip of paper is passed over the surface of the solution before commencing floating operations. The addition of liquor ammonia is unnecessary, as a slight fuming answers infinitely better.

Should the bath become discoloured, no matter; the first washing will remove every trace of its effects. The discrepancies that occur in the results obtained when a new or modified process is started is owing to the almost entire ignorance of governing principles that pervades our ranks. My earnest advice to my brethren assistants is, study hard until you master principles, for whilst you regard your art as a species of picture cookery, you will always be in difficulties.

And now, in conclusion, I direct attention to the fact that chloride of silver is held in suspension by a moderately thick solution of gelatine. I was induced to try the experiment whilst working out the collodio-chloride process in order to test the correctness of preconceived views respecting the cause that enabled collodion to retain chloride of silver in suspension. I had attributed this phenomenon to the force of cohesion being greater than that of gravitation, the glutinous properties of the collodion proving sufficiently strong to support the minutely divided particles of silver. On testing with gelatine, I found that similar results followed; the chloride of silver in a weak or dilute solution was precipitated, while a stronger body of gelatine held the atoms perfectly in suspension, thus proving the cause to be a physical one.

My chief reason for offering these last remarks is to induce experimentalists to test the printing qualities of gelatine thus associated with silver. My earliest leisure time I intend employing in this direction, for should it prove equal to my present anticipation, it will prove a wrinkle worth seeking. Will you, sir, kindly induce your readers to join in the pursuit, and oblige yours faithfully,

Nov. 6th, 1865 A Photographer's Assistant.

Proceedings of Societies.

London Photographic Society.

The first meeting of the session was held in King's College on the evening of Tuesday, November 14th, Mr. Glaisher, F.R.S., in the chair. The meeting was large and animated, about eighty members being present. After a few words of congratulation and welcome from the Chairman, in which he called attention to the numerous fine results on the table, and hoped for a prosperous and pleasant session, the minutes of a former meeting were read and confirmed.

The following gentleman were then elected members of the Society:—Messrs. Herbert J. Robinson, J. Mudd, J. Adams, J. Stewart Dismorr, and Walter Woodbury.

The Chairman then called upon Mr. Mayall to proceed with his paper, when a singular scene took place, which, but for the dignified firmness, tempered with moderation and courtesy, of the Chairman, might have effectually interrupted and put aside the interesting business announced for the evening's proceedings.

Major Russell rose, and said he wished to read some remarks to the meeting.

The Chairman said that the order of the business must be preserved, and Mr. Mayall's paper came next in order.

Major Russell said it was immaterial to him whether he was heard or not, but persisted in addressing the meeting. He said that he had been attacked at the last meeting by the Chairman, and he had since been abused in the journals, and he was there to meet his abusers.

The Chairman said he was in the hands of the meeting, but he could not permit the matter to be renewed in that manner. He had not the correspondence from which he had felt it necessary to read extracts at the last meeting with him, and he would not speak on the subject from memory. The whole of the correspondence was open to the inspection of the members, who could form their own opinion if they felt further interest in the matter. Major Russell knew that the matter would be brought before the last meeting, and had full opportunity at that time of answering anything said. He had attacked no one, nor made charges of any kind.

Major Russell said if he was not attacked by name, he was referred to (confusion, and cries of "Order").

The Chairman appealed to the meeting to support him, and was greeted with loud applause. He again called on Mr. Mayall to proceed.

Major Russell persisted, and said he had been offensively attacked in the journals, and he wished to answer these attacks. He continued: "Do you refuse to hear me?" Loud cries of "Order" followed, in the midst of which he said he must then request that his name be removed from the Society, which was followed by cries of "Hear, hear," and ironical applause.

The Chairman expressed his deep regret that Major Russell should have taken such a course.

Mr. Mayall said it would have been perfectly competent for Major Russell to have given notice of anything he wished to bring forward; but without such notice or intimation to the council it was clear that he could not ask to be heard when other business was before the meeting.

Major Russell was proceeding to speak again, when

The Chairman said: Sir I will not hear any more (loud applause).

Major Russell then handed a roll of paper to Mr. Taylor, saying, "Mr. Taylor, you report for your own journal; I hand you this, and you can show it to the other reporters if you choose." Mr. Taylor took the scroll, and handed it over to the Secretary of the Society.

Mr. George Dawson said he also wished to make a statement. He had been attacked at the last meeting, and had no opportunity of replying, having had no notice that the matter would be brought forward.

The Chairman said: Sir, I wrote to you myself, and gave you full notice. No attack was made on any one. It is clearly out of order to interrupt the present proceedings without notice, and as the meeting dissaproves, I cannot permit it (applause).

Mr. Dawson: Do you refuse?

The Chairman: I do sir (loud applause).

Major Russell and Mr. Dawson having left the room, the ordinary business proceeded with great interest and animation.

Mr. Mayall read a paper on the "Construction of the Glass-room and Lighting the Sitter," illustrated by means of diagrams on the black-board as he proceeded. The prominent idea which he wished to impress was the importance of one dominant light; this he preferred from a high side-light, from which should be continued a roof-light placed at an angle of 45°, with fluted glass to admit soft light to give detail in the shadows. An animated discussion followed, in which Messrs. Hughes, Allen, Fry, Cole, Buchanan Smith, Sebastian Davis, and Mayall took part; but which we shall postpone stating until the publication of the paper at length.

Mr. Mayall exhibited some exceedingly fine specimens of enlargement by direct printing. One, a portrait of himself, was the finest untouched enlargement we have ever had the pleasure of seeing. He also exhibited some fine specimens of collodio-chloride of silver on opal glass.

The Chairman, in proposing a vote of thanks, remarked on the interest of a paper on such a subject from a gentleman with whose name and works they had been familiar almost as long as they had known photography. Thanks were expressed by acclamation.

As the hour was getting late, the question was put as to whether Mr. Hughes's paper on the Preparation of the Iron Developer, so as to produce intense negatives, should be postponed until December; but a feeling having been expressed that it should be read, Mr. Hughes proceeded with it on the understanding that the discussion should be postponed (see p. 545).

The Chairman then called on Mr. Cooper for his paper on the same subject.

Mr Cooper thought it would be better to take his paper as read, as it would appear in all the journals. At the December meeting, when the subject was discussed, he would exhibit his specimens.

Mr. Hughes exhibited a number of very charming portraits and landscapes, at once delicate, soft, and brilliant, which were from negatives developed by one application of the solution he described, and also a series of fine large landscape negatives, clean, delicate, and vigorous, illustrating the peculiar results of the developer.

A vote of thanks to Mr. Hughes was carried by acclamation.

The Chairman called attention to the numerous very fine examples of photography on the table, amongst which were some very admirable pictures, by Mr. Frith, of Swiss scenery, with Ross's new doublet, including a very wide angle; some charming pictures by Mr. Russell Manners Gordon, by Dallmeyer's new wide angle landscape lens; pictures by Mr. Buxton, by the same lens; pictures, by Mr. England, of Swiss scenery, by the same lens; a view of the Crystal Palace, including the whole frontage, by Negretti and Zambra, by the same lens; landscapes by Mr. F. Howard, by the same lens; specimens, by Mr. Robinson and others, of Mr. Simpson's process on opal glass; studies of trees, with and without foliage, by Mr. Fox; Swiss views, by Mr. Stephen Thompson; and a variety of other fine specimens.

The Chairman announced that at the December meeting, in addition to the discussion on the Iron Developer, Mr. Woodbury would read a paper on one of the most important discoveries of the day, the Photo-Relievo Printing Process.

After some votes of thanks the proceedings terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held in the City of London College on the evening of Thursday, November 9th, the Rev. F. F. Statham, M.A., F.G.S., in the chair. The minutes of a former meeting having been read and confirmed, Messrs. Quentery, J. Y. Farmer, and F. M. Good were elected members of the Society.

The Chairman called the attention of members to the fact that the annual dinner of the Society would be held on Saturday, December 2nd, at the Salutation Tavern.

Mr. V. Blanchard then read a paper on "The Necessity of Art Culture to Photographers" (see p. 542), which elicited considerable applause.

The Chairman said he was glad to see Mr. Blanchard come to the rescue of Mr. Wall, who in dealing with a similar subject at the meeting in June was somewhat in a minority, and thought that Mr. Blanchard was one of his opponents. He thought that the study of art could not fail to be beneficial to every one, tending materially to increase their enjoyment of life, as accurate appreciation of all good things was necessary to their thorough enjoyment. In music, for instance, many persons did not get half the enjoyment of it which others had, simply for a want of knowledge of it. He had been struck with Mr. Blanchard's question in reference to photography, whether it was to stand still or advance into a higher art position. Photographers generally would, he hoped, agree with him in saying there must be no standing still. Progress had hitherto been very rapid, and he did not see why they might not hope for still greater things. He thought the suggestion of Mr. Blanchard as to the formation of a library a most valuable one, and he hoped it would be carried into execution.

Mr. Wall, in agreeing heartily with the greater part of Mr. Blanchard's paper, suggested that in the proposed library not merely books but photographs of good pictures by good masters should be included. Leslie had pointed out a large collection of such works as had educational value, and also pointed out in what they realized the sentiment of art.

Mr. Wharton Simpson remarked that so far as Mr. Blanchard's comments on the importance of art culture to photographers was concerned, it appeared to him that there was literally nothing for them discuss. Every one present must, he thought, be prepared to endorse the eloquent remarks to which they had listened. In regard, however, to the suggestion of a library, he thought they might deal with that at once by discussing the propriety of giving it a practical form without delay. The idea was, he thought, a most admirable one, and if carried out it could not fail to be useful.

A long and desultory discussion on the subject followed, in which the advantages and difficulties attendant on the formation of a library or book club were discussed, the Chairman, Mr. Sebastian Davis, Mr. Howard, Mr. Wall, and others taking part. Finally, it was proposed by Mr. Simpson, and seconded by Mr. Harmer, that a book club be established in connection with the Society, for the circulation of works to aid the culture of art science amongst the members of said club. The resolution was carried, and seventeen gentlemen at once put down their names as members of the club.

After some further general conversation on art, in which Mr. Davis remarked on the importance of instantaneous photography in realizing the best art results.

Mr. Blanchard remarked, in reference to the observation of the Chairman, that at a former meeting he rather objected to the sweeping and wholesale character of Mr. Wall's remarks than objected to their intention so far as they aimed at stimulating photographers to increased art culture. In enforcing the importance of the library or book club, he wished especially to point out that photographers required training to appreciate the various works of great masters which, as it had been pointed out, were so readily accessible in various galleries. They required that education of the faculties which would make them appreciate a good work of art when they saw it, and know in what its excellencies consisted. This would come from the study of good books on art. To illustrate what he meant, he might mention a recent conversation between himself and a cultivated musical friend on the works of Handel. He, as members knew, was exceedingly fond of music, and he thought he had admired and appreciated the works of Handel as much as many persons; but his friend, in reply to a remark expressing general admiration, said, "Ah! but do you see what he has done?" and then proceeded to point out the delicate shades of expression and intention, the science and skill with which difficulties had been met, and unexpected and charming results obtained. After these educational remarks his appreciation and enjoyment of the music were still greater. And so it was in art: some knowledge was necessary to accurate appreciation, and it was in this way that the circulation of the works of such men as Ruskin, Leslie, and others would be of the utmost value, and become the interpreters, as it were, between the reader and the pictures of the great masters.

Mr. J. C. Leake then read a description of a new sink he had devised for assisting in saving silver in developing, &c. (see p. 544).

Mr. J. T. Taylor ignited a portion of powder consisting of antimony, magnesium, sulphur, and nitrate of potash, which gave a momentary flash of very actinic light, with which he stated instantaneous photographs could be produced.

After some conversation on future papers, Mr. Taylor promised a *résumé* of what had been done in producing photographs in colours for the December meeting, and Mr. Harmer promised a paper for a subsequent meeting.

After several votes of thanks the proceedings terminated.

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Correspondence.

THE CARMARSAC AND POITEVIN ENAMELS.

Sir,—When I had the honour of describing, through the medium of the Photographic News, what I saw in Paris of the enamel processes, I named briefly that the open-heartedness of M. Poitevin, who made fully known all his manipulations and experiments, contrasted with the reticence (or concealment) of M. de Camarsac, who would tell me nothing whatever of the principles on which he worked.

I did not name this contrast in at all an offensive manner, and as most persons would see at once *why* M. de Camarsac wished to keep a process entirely in his own hands, the statement of the fact might have passed for what it was worth, and so gone peacefully to oblivion. But M. Camille Silvy will not let it so rest. He has fears, I suppose, that some wicked persons might attribute to M. de Camarsac interested motives for his reservation; so, in the quality of friend and agent of the clever enameller, he hastens to show that it is quite the other way, and that the photographic world is really under obligations to M. de Camarsac for withholding all information touching enamels—except the price. The following is what M. Silvy calls a "justification" of M. de Camarsac. "Lafon de Camarsac keeps secret his 'modus operandi,' it is true; but he does not keep exclusively for himself the privilege of producing pictures on enamel; he does them for anyone, and from any negative." M. Silvy should have added, "for a consideration, after the manner of photographic printers." I hope I am not wrong in calling M. de Camarsac a "photographic printer," seeing that he undertakes the printing of negatives from all sources on plates of enamel or porcelain instead of on sheets of paper; and I trust I shall be pardoned if I say that I give M. de Camarsac far more credit for sound discretion than for liberality, in not attempting to forbid photographers making experiments in enamel printing. Again: "Devoted to the ceramic art he (M. de Camarsac) confines himself to the operation of enamelling, and, by doing so, renders greater service to the profession than if he were to publish his process and let it fall into the hands of everyone," &c., &c. This seems to be rather a demand on our credulity than an appeal to our reason, and the wicked people I alluded to before might suggest that, in the foregoing sentence, the substitution of the word "himself" for "the profession" might be a nearer approximation to the truth; failing this alteration, the sentence as it stands resolves itself into the following very extraordinary proposition: "The concealment of a discovery in an art is a positive benefit to the many who practise that art."

Now, I beg to say that I do not find fault with concealment, if you call it by its proper name, and consider it as a *trade secret*; I only object to it being paraded to us as a species of beneficence. I gladly paid M. de Carmarsac two pounds for one of his clever specimens of enamel printing (not from his own negative); but I should hardly regard this skilled producer and seller of a charming object in the same light I should have done had he given his experiments to the world, to be thought on by the busy brain of the many among whom his manipulative skill would have secured him at least an equal amount of pecuniary advantage, and I am thankful that we in England are losing what tendency we ever had to make "secrets" of either the particular manipulations or modifications of photography; and our journals have done right good service in fostering this liberal feeling among the professors of an art which, I hope, I may be allowed to call "fine" as well as "liberal."

Perhaps I may be allowed to point out that M. Silvy is slightly in error in stating M. Poitevin's enamels to be "unsatisfactory," as I am accustomed to hear the specimen I brought with me from Paris called "very beautiful," though, as I said, I myself do not think M. Poitevin's enamels are to be compared with those of M. de Camarsac.

John Anthony, M.D.
Washwood Heath, near Birmingham, Nov. 6th, 1865.

Photographic Notes and Queries.

Modes of Washing Prints.

Sir,—In perusing Professor Towler's interesting description of various modes of washing prints, which appears in a recent number of the Photographic News, the reader, I think, would be (as the writer evidently has been) led into the error of supposing that my machine, though an "improvement" upon, is nevertheless a copy of Dr. Reissig's, and was patented subsequently to the publication of the description of the Doctor's.

This, sir, as you know, is not the case, and I trust you will do me the justice of correcting that impression in your next number, more especially as Professor Towler's information appears to have been derived from your critical notice of my machine (Photographic News, Sept. 8th), in which there is not only an important omission—namely, the date of the patent—but in which you state that I have "*just* patented," &c., whereas the description was left with the Commissioners of Patents on the 23rd August, 1864, about ten months before the publication of Dr. Reissig's, as alluded to by the Professor, and more than six months before the Doctor's apparatus was briefly described in the Foreign Correspondence of the Photographic News on the 31st March, 1865. My patent was *sealed* Feb. 14th, and thenceforth received publicity, being six weeks previous to Dr. Reissig's brief description above alluded to.

Referring to the efficiency of the machine, the Professor says it "will free the prints more effectually from hyposulphite than any other known contrivance," yet he cannot recommend it to a large establishment, "where a thousand and more prints have to be washed daily." I am reluctant to say much upon this head until I have the machine before the profession, when I hope to be able to demonstrate its capability of effectually washing that number in one batch, without liability of tearing the prints, and in little more than as many minutes as hours are now consumed in the process.—Apologizing for thus troubling you, I remain, sir, yours, &c., J. E. Grisdale.

25, *Cranbourn-street, W.C., Nov.* 13, 1865.

P.S.—I should be happy to forward a copy of my specification to Professor Towler. Could you kindly give me his address?

[Professor Towler's address is at the Medical College, Geneva, New York, United States.—Ed.]

The Modified Fothergill Process.

Dear Sir,—May I suggest to those gentlemen who intend trying the Fothergill process of Mr. Ackland that they at the same time prepare some plates with the prepared albumen still more diluted, even to double the amount, and, instead of using the albuminate of silver, add one grain per ounce of carbonate of soda (or half a grain) coating the thoroughly washed plate with this solution, and then drying it. You will observe this is my old "hobby" again, only albumen in place of gelatine, which does not wrinkle, and is altogether, I think, the most physically suitable substance; a *trace* of bromide may be very beneficial in the coating solution, but probably not a *sine qua non*. I have no time for trying these plates now, but from past experience I feel pretty confident that they will be found to produce a very sensitive and firm film, giving a vigorous, delicately detailed negative.—I am, dear sir, yours, &c., Wm. Bartholmew.

Egham, Nov. 13, 1865.

The Gelatino-Iron Developer.

Sir,—I must just send you one line to correct an error in one of my former letters. I said that the acid and gelatine might be kept mixed for any length of time. I do not find on longer trial that this plan is nearly so good as that of mixing the two the evening before the solution is wanted. I may further remark, in answer to a correspondent in last week's News, that though, of course, the tendency to intensity with this solution is much greater than with the ordinary iron developer, yet the ultimate intensity of a negative is quite under control in many obvious ways; and, with a little practice, white skies may be easily avoided.

The bath may be kept quite neutral, if thought necessary, and thus, with an addition of about ten minims of formic acid to one ounce of developer, the work may be made as rapid as with any other formulæ which I have ever tried.

The formula for nitrate of glycocine, in the developer which I told you of, may stand thus:—

Gelatine	2 drachms
Water	to dissolve
Nitric acid (to be added while still hot)	1 drachm.

Calculate the quantity, and use about 5 to 7 minims of the nitric acid to 120 grains of iron and 100 minims of glacial acetic acid; formic acid may be used with this developer, if thought any advantage, but, on the whole, I think it works rather better without. I think that the only advantage to be claimed for this solution is that, by using nitric acid, we save time in neutralization, but this is not very important. The result is, I think, a little more liability to fog than with the old formula with the sulphuric acid.

I cannot give a very decided opinion yet between these two formulæ, though I think that the sulphuric acid is the best.

The stain which you found in some experiments, described in last week's News, is of purely mechanical origin, and may be avoided by using less gelatine in the developer, or, I think, more acid in the gelatine.—Yours truly,

Belmont Lodge, Lee, S.E. Nelson K. Cherrill.

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Talk in the Studio.

Photographs on Ivory, &c.—We notice in a recent list of American patents one by W. H. Smith, of London, for preparing wood, glass, silk, ivory, and other substances for the reception of photographic pictures. No particulars of the method are mentioned.

Robbing Employers.—A few weeks ago, in noticing several cases in which operators were charged with robbing their employers, we mentioned one, reported in a Shrewsbury paper, in which Charles Jackson was charged with stealing some negatives and prints of his employer, Mr. Groom, and committed for trial. We have pleasure in noticing the termination of the case by an unhesitating verdict of "Not guilty," when the charge came to trial. The case is reported at length in the *Shrewsbury Free Press* of Oct. 28th, and from it we glean that the case rested chiefly on a few stereoscopic and a few card prints being found in the possession of the accused, and which he accounted for to the satisfaction of the jury. From Mr. Jackson's statement of the case, in a letter to us, and from the evidence adduced at the trial, it would appear that the charge was chiefly due to some ill-feeling against the accused. We know nothing of Mr. Jackson, but it affords us much pleasure to announce the triumphant acquittal of any member of the profession from a vile and dishonouring charge.

Photolithography.—Messrs. Bullock Brothers, of Leamington, send us a specimen of a new photolithographic process which they have just patented. They promise to send us particulars as soon as their protection is secured, and also promise some better examples of the process. It will, perhaps, be just to them to wait for the best specimens before offering an opinion on the process.

An alleged New Process.—Mr. Fred Smith, of Leamington, writes to us to the effect that he understands that some one, whom he does not name, but resident in that town, is making claim to the origin of a new process of which he claims to be the inventor. As he does not name or describe the process, we are uncertain as to what he refers. He says:—"I enclose a print, from which you will see that although it is not as yet equal to silver prints, the agents I have used in printing are sensitive to light — the ingredients used by me being vinegar and oil, in proportion to three of the former to one of the latter. The print I enclose is merely printed, being neither toned nor fixed. I intend to make further experiments when time will allow of it. Should any of your readers procure better results I hope they will make it known to the profession." The print enclosed has the appearance of a rich, warm, chesnut-coloured print on plain paper. Mr. Smith has, however, omitted to state the object of the process, or the sensitive material used. The oil and vinegar referred to are doubtless used as the vehicle; but we are not aware that they are sensitive to light. We shall be glad to hear further from Mr. Smith.

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To Correspondents.

Opal.—The proportion of nitrate of soda generally recommended for the printing is in the ratio of 60 grains of nitrate of soda to each ounce of 30-grain silver solution. 2. Blue litmus paper will turn red when in contact with an alkaline solution. Your description of "transparent lines in the direction of the dip" is not sufficiently definite to enable us to know what you mean. 4. A mottled film generally arises from the use of a collodion which is too thick, and wanting in limpidity. What kind of deposit do you refer to—is it fog?

A Mayfield Subscriber.—We have not seen either of the contrivances to which you refer in this country, and do not know any one who keeps them. In our experience, all the methods which have been devised for working wet collodion in the field without a tent or dark box are, except for very small plates, more trouble than use, and they have therefore never become common. For very small plates, the plan described by Mr. Barrett in our pages in a former volume, is the simplest and the best. For plates such as you mention Blanchard's dark box is best. 2. It is quite possible to succeed moderately well with portraiture in the open air, if a little care be used. If a wall facing north be convenient, place a screen for background at right angles with it, facing east; then, if possible, suspend a white sheet a few feet above the head so as to form a canopy, and prevent a direct top-light reaching the sitter. By such an arrangement very good portraits may be secured. It would not be difficult to construct a framework, consisting of a backgound with hinged screens at each side, and a canopy overhead, which might be moved about, and placed in any position. 3. We have not tried the lenses in question, and have not heard of them being used for stereoscopic work. 4. It is a little uncertain. For ordinary work there is nothing better than the acetate bath for warm tones, and the lime bath for black tones, employing the ordinary chloride of gold.

W. Bartholomew.—We see no reason why the cards you enclose should not enlarge up to whole-plate size without difficulty.

A. B. C.—We presume that grooved wood, for plate-boxes, can be obtained of the makers of photographic woodwork, such as cameras, &c.

T. J. M.—If a studio be sufficiently wide to make the top-light practically a high side-light, then you may dispense with side-light; but we should certainly not dispense with side-light if we could by possibility secure it. 2. We prefer to place the sitter facing the east, and allow him to be chiefly illuminated from a north side-light.

Allen Benson.—The collodio-chloride film splitting after the picture is dried and completed, or during drying, may proceed from one or two causes; it may be the result of using a dirty plate, or more especially of a damp plate; or it may be the fault of the collodio-chloride, which may possibly be too contractile.

Henry W. Taunt.—We are uncertain of the cause of the spots, of which you forward us an example. In some respects they resemble the results of imperfect fixation, but such spots are generally of a yellowish brown, whilst these are of a pale greenish yellow. The fact that the spots do not show until some time after the prints have been fixed is very suggestive of imperfect fixation from some cause. When spots of insoluble hyposulphite of silver are formed in a print, they are not visible until a decomposition takes place, which generally occurs in washing, and a yellow or brown spot or patch is the result. Anything coming into contact with the print while the hypo is still in it, which would decompose it, might tend to such a result. We have seen it occur from a particle of citric touching the print when fresh from the fixing bath; the spots just resembled those in the print you have sent. We shall have pleasure in hearing the experiences of which you speak.

Adam Distin.—We shall have pleasure in seeing the photographs you name.

A. Barnes.—You will get the information you require from the work on the magic lantern which we recently noticed. The address of the publishers is Paternoster Row.

Hypo.—For fixing negatives use a saturated solution of hypo. 2. A few minutes. 3. Yes; the negative requires more thoroughly washing than when fixed with cyanide. 4. Use a dipping bath for the hypo, and leave the negative in whilst the next plate is in course of preparation. 5. It is quite impossible to say what the majority of operators do; we fear they use cyanide; but all the ablest men we know, such as T. R. Williams, H. P. Robinson, Jabez Hughes, V. Blanchard, and others, use hypo. 6. We should give the negative twice as much washing as when fixed with cyanide.

Amateur.—We have not had sufficient experience with the process to advise you efficiently, but will make some enquiry and return to the subject probably in our next. We should think the collodion you name might answer, or that we mention in our article on collodio-chloride. When you read the experience of the Chairman of the North London meeting, described in our last, you will see how difficult it is to say which collodion is most suitable for the tannin process.

Stereoscopic.—A material known as black twill is suitable for covering tents. 2. Monckhoven's "General Treatise on Photography" is not published in English; an abridgment is, by Messrs. Horne and Thornthwaite, of which the price is, we believe, half-a-crown. 3. You may increase or decrease the proportion of iron in the formula you name, but you will, of course, in the same ratio increase or decrease its activity. 4. Mr. Robinson's pictures can be obtained by application to him at 68, Canonbury Park South. We are uncertain whether the "Autumn" is in print. 5. On the whole, we think Mr. England's instantaneous shutter is best. 6. Plain collodion kept in a well stopped bottle in a dark, cool place will sometimes keep for years without change.

T. G. says that a lady has copied some unregistered portraits as transparencies for the magic lantern, to exhibit at Penny Readings, and is threatened with an action by a photographer whose work the portraits are. Such a threat is foolish and useless. There is no ground of action in such a case, as the legal conditions upon which copyright depend have not been complied with. In any case it is surely a churlish action to wish to check the pleasure afforded by the exhibition of local celebrities under such circumstances.

W. C. L.—It is possible that with a small stop the lens in question might cover a 5 by 4 plate, but we are uncertain. 2. The lime bath is the best for securing black tones.

J. S. Anderson.—We have not heard further of the matter, but will make enquiry

Unfortunate Harry.—You had better mix your waste developing solutions and your cyanide solution with your hyposulphite, and reduce the whole as sulphide of silver. 2. Most samples of negative collodion may be used for positives, but in most cases they will be improved by the addition of a little more bromide. In such case the two samples you mention will doubtless answer. 3. It is probable that your toning bath is inert or exhausted. Add more gold, or make a new one.

Gun Paper.—The chief cause of your paper dissolving in the acids is the presence of too much water—that is, the acids are too weak. Either use stronger nitric acid, or add a much larger proportion of sulphuric acid. The weaker your nitric acid the larger the proportion you will require of sulphuric acid. Try double the proportion of the latter. Ordinary tissue paper is unsuitable; it must be on unsized paper, such as blotting paper or *papier Joseph*.

Developer.—Your general plan appears good. The door may be in the opaque part. To follow Mr. Leake's suggestion and get a little light on the background behind the sitter, you must have a small window in the opaque side part, which can be readily covered up when not required. We should prefer 10 feet at the eaves to 8 feet. The camera stand you mention is not suitable for the glass room. We will consider your request. We have not one at present.

Registrations and several Correspondents in our next.

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GELATINE IN THE PRINTING BATH.

The voluntary introduction of organic matter into a bath of nitrate of silver seems, at first sight, a proceeding so opposed to photographic principle and precedent that few photographers would be likely to greet a suggestion as to the advantage of such an addition with more than a shrug of incredulity. That certain specific advantages are to be gained, however, by the use of gelatine in the printing bath seems, according to our present evidence, to admit of very little doubt. The examples first forwarded to us by Mr. J. E. Palmer, the originator of the method, the prints we produced with a portion of the printing bath he then forwarded to us, and the specimens we have recently received from our esteemed contributor the "Photographer's Assistant," all prove the unquestionable excellence and brilliancy of prints obtained from such a bath, whilst some recent experiments we have made, in conjunction with Mr. H. P. Robinson, confirm the position in a remarkable degree.

Experiments with new formula should, to be satisfactory, be comparative; and in these, a twenty-grain silver bath with gelatine was compared with a new sixty-grain silver bath without addition of any kind. Prints were tried from the same negatives, landscape and portrait, on the same quality of paper, in the same light, toned in the same bath, and treated, in short, in all respects the same. Before going into further detail we may state broadly the results. The prints from the weak gelatine bath were decidedly more brilliant than those from the plain sixty-grain bath: they printed a trifle more slowly, assumed a redder tint in the printing frame, retain a warmer, richer hue in the toning bath, with less tendency to greyness, the picture in all the stages of progress, as well as in the finished print, looking less sunken and more entirely on the surface than the print from the stronger bath. Another singular characteristic of the pictures from the gelatine bath is an increased substance or body in the paper, which is very obvious when the prints are in the various solutions, and which is retained when they are dry. The results were, in short, decidedly richer and better from the gelatine bath than those from the strong plain bath, the simple advantage which the latter possessed being its slightly superior sensitiveness.

One of the difficulties which beset the use of gelatine at the outset is the variable quality of the different samples, which renders it almost impossible to give any definite statement of formula for general use, and leaves each experimentalist under the necessity of exercising careful judgment and determining the proportions necessary in his own operations. A brief history of a few experiments will illustrate this, and be suggestive to those who wish to try what promises to be a most important improvement in printing. A drachm of Nelson's patent gelatine was added to sixteen ounces of water and left in soak all night; in the morning it was warmed until the gelatine was quite melted, and then four ounces of water containing four hundred grains of nitrate of silver were added, thus making a pint of a twenty-grain solution, containing three grains of Nelson's gelatine per ounce. This was placed before a bright fire, and filtered whilst slightly warm. On standing a few hours after filtering, however, a white semi-opaque slightly spongy looking deposit, with patches of orange-coloured matter, was thrown down. On floating a sheet of paper, this solution was found to be decidedly too thick and viscous for convenient use. With most samples of gelatine a three-grain solution is quite limpid at even a low temperature, but with this in hand the solution was hopelessly gelatinous and unmanageable, rendering it impossible to lift the paper from the surface of the solution without having clots of gelatine in various parts, and forming a streaky ridge of gelatine at the lower end, the air bubbles at the same time being most formidable. Five ounces of this solution were then taken and added to fifteen ounces of a plain twenty-grain silver solution. This was found to be slightly more viscous than was desirable, but the prints were excellent. Half a drachm of ammonia was then added to the pint of solution, the effect of which was to make the solution more limpid, and remove the tendency to form troublesome air bubbles on the surface, without in any degree interfering with the excellence and vigour of the prints. This solution, after standing a few days, threw down a slight semi-opaque white precipitate, but has continued in excellent working order, after yielding some scores of prints, preserving in all cases, when working side by side with a sixty-grain plain nitrate solution, its superiority in yielding rich and vigourous prints.

It will be seen that in this bath a proportion of gelatine which did not exceed three-quarters of a grain to the ounce of solution gives results having marked advantages. It is probable that with some samples of gelatine the proportion recommended by the "Photographer's Assistant," which we first tried, of a drachm of gelatine to a pint of silver bath, would not be too much; but it is clear that some observation and judgment must be used, and that the process should not be thrown aside because the first formula which may be tried does not give satisfactory results.

Another of the advantages of this bath is that paper floated upon it seems to keep better than that treated with the usual silver bath. This we have found in our limited experience. The "Photographer's Assistant" states that paper which has been kept a few days is as pure in colour, tones as well, and the finished print is in all respects equal to those executed and finished on the same day. The bath gradually becomes a little discoloured if allowed to get weak, but this does not in any measure injure the purity of the print. Of course in all cases a twenty-grain bath will sooner require strengthening than a sixty-grain bath, but this by no means proves that the use of the weak bath secures no saving. However carefully all the residues may be saved there is an inevitable loss in drippings, rinsings of dishes, washing waters, &c., the whole of the silver in which is never recovered. If as good results can be obtained by the weak bath with gelatine as with a strong bath without, the saving in these matters, and in others not necessary to discuss, this alone would render the experiment well worth the attention of photographers; but since the prints are richer and more brilliant altogether, the question becomes a very important one to all concerned in excellence and economy.

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CHLORIDE OF SILVER IN COLLOID SOLUTIONS.

A communication we received from our valued collaborateur, the "Photographer's Assistant," a few weeks ago, from which we published some extracts in our last, suggested experiments with gelatine in solution, as a vehicle for holding chloride of silver in suspension, after the manner of collodio-chloride of silver. The fact once ascertained that a substance like chloride of silver could be formed by double decomposition, in solutions which would hold in a state of subdivision so fine as to resemble solution, the idea of using other viscous fluids besides collodion was so obvious, that it followed almost necessarily.

The condition to be secured was a fluid in which nitrate of silver and some chloride could be separately dissolved, which should be at the same time sufficiently viscous to hold the particles of chloride of silver formed by the reaction between the nitrate and chloride in suspension, and which would dry into a hard transparent film insoluble in the aqueous toning and fixing solutions and the water necessary for washing. It was also necessary that such fluid should itself be either neutral to salts of silver, or, if it combined in any degree with them, that it should conduce to sensitiveness or vigour. Collodion, it will be seen, possessed all these conditions; the salts necessary to form chloride of silver are sufficiently soluble in collodion; it is sufficiently viscous to hold the sensitive salts in perfect suspension; it is neutral to those salts; and it dries into a fine clear transparent film, insoluble in the toning and fixing baths and washing waters. These qualities, which render it pre-eminently valuable as a vehicle for the sensitive salts in producing negatives, were the very qualities which rendered it valuable in the collodio-chloride of silver process. Nevertheless it was natural, as we have said, that attention should be directed to other materials, to ascertain if any of them possessed the necessary conditions in a degree which might supersede collodion. If a material could be found which was cheaper, easier to use, or more successful in result, it would have repaid experiment. Can such a material be found? We doubt it; but the subject is worth examination and enquiry.

Some months ago we gave the subject some little thought, and made one or two hasty experiments. The first vehicle we tried was a thick spirit varnish, to which the due proportions of nitrate of silver and chloride were added. The result was not encouraging; the solution rapidly permeated the paper, leaving a granular dead surface of varnish. The paper so prepared printed very slowly, assuming a red colour, and lost considerably in toning and fixing, giving finally a mottled weak picture. We intended to make a second trial, but in a few hours the chloride of silver had precipitated, and the preparation was useless. The result was so discouraging that we made no further trial.

Albumen and gelatine both presented the necessary viscous qualities, but they failed in other qualities. Albumen was unavailable because it combined with the nitrate of silver at the outset, and produced an insoluble precipitate. Gelatine was more promising: it was comparatively neutral, admitted readily of the nitrate, and the chloride being dissolved in its solution and in drying formed a clear transparent film. The great difficulty to be apprehended was from the solubility of gelatine in aqueous solutions. It was worth trying, however, and we tried it: the result was simply *nil*—the print was dissolved and entirely lost in the toning bath. We put the process aside at the time without further trial.

Since receiving the letter of our friend, the "Photographer's Assistant," we resolved once more to try gelatine. Our argument for further trial was based on the knowledge that the sample of gelatine we tried before was one which was readily soluble even in cold water. Those who have had experience with samples of glue and gelatine know that some samples when placed in cold water partially dissolve at once, whilst others swell up, but do not dissolve; these are the best qualities. It occurred to us that if we used a sample of this kind, a print formed by its aid might, with care, be passed through aqueous solutions without being destroyed. We therefore, with this view, undertook some further experiments.

A drachm of Nelson's patent gelatine was placed in an ounce of cold water until it was soft. Twenty grains of nitrate of silver were dissolved in six drachms of water; and four grains of chloride of sodium were dissolved in two drachms of water. The nitrate of silver was then added to the gelatine, which had been made fluid by heating; the chloride solution was then added, and an emulsion of chloride of silver, without any tendency to precipitate, was obtained. A plate of opal glass was coated with the warm solution, and, after drying, exposed under a negative. It printed to foxey brown colour, being somewhat less sensitive than collodio-chloride of silver; but this print looked vigorous and promising. To shorten the time necessary for the action of aqueous solutions we placed it in a fixing bath, containing gold, so as to tone and fix in one operation. At first all appeared to go well, but on lifting the plate the image began to run, and finally washed off. A piece of paper was coated with the same preparation, dried, and exposed. It printed to a rich brown, giving a vigorous image. When a little over-printed, it was placed in the toning and fixing bath mentioned. It apparently resisted the solvent action, but, on washing, the vigour of the image gradually disappeared, leaving a faint picture consisting apparently of as much of the preparation as had penetrated the paper, all the image formed by the gelatino-chloride of silver on the surface of the paper being dissolved.

In a further essay with the same preparation, after printing we immersed the print in a weak alcoholic solution of chloride of gold, to which we added no alkali, as that would tend to dissolve the gelatine. After remaining some time without any apparent toning taking place, we added to the gold solution an equal bulk of a saturated aqueous solution of hypo-sulphite of soda, on which toning and fixing both proceeded without dissolving the image. This picture, after a few careful washings, we saved without further loss than a slightly impaired definition and want of sharpness. Another print was immersed in a strong solution of tannin, and left for a quarter of an hour, which rendered the gelatine partially insoluble; but whilst in the fixing bath the image, without dissolving, became so soft as to run altogether out of form, and become useless.

It is not improbable that some means might be found to work such process if the result were worth the trouble;* but altogether apart from these difficulties, there are others which render it doubtful whether any advantage could be gained by substituting substances such as gelatine for collodion as a vehicle for chloride of silver. It is very difficult to use, as the solution can only be employed warm, and those who have tried to coat a plate of glass or a sheet of paper with a thick solution of gelatine know how difficult it is to get it to flow evenly. If the process of toning and fixing be performed without dissolving the gelatine, the film, whilst wet, would be so easily injured that it would be almost impossible to wash two prints in the same dish of water without injury, and it would be especially difficult to give them long soaking and many changes of water without injury. When completed, there is no reason to believe that the picture would be better, and it is certain that it would be more liable to injury from moisture, and, from its hygroscopic character, more liable to fade and change. As, however, the fact is apparent that chloride of silver may be suspended in glutinous bodies, it may be worth the effort to discover some body which will fulfil all the conditions, and be at the same time cheaper than collodion.

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* Since the above was written we have received a communication from Mr. J. E. Palmer, who states that he has accomplished printing with gelatino-chloride of silver satisfactorily; but he does not state how the solubility is overcome.—Ed.

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MR. SWAN'S CARBON PROCESS.

We have an announcement to make which will be received with interest and pleasure by photographers generally. The carbon process is now a practical commercial reality, in regular daily operation. We have just received from Mr. Swan three twelve by ten prints from landscape negatives by Mr. Bedford, which are as perfect examples of printing as we have ever seen produced by any process: they are rich in colour, perfect in gradation, and admirable in texture of surface. Unlike some of the earlier specimens of the same process, these have not a highly glazed surface, the amount of gloss here being somewhat less than that of albumenized prints. It so happens that we have in our portfolio silver prints from two of the negatives from which these carbon prints are produced, and are thus enabled to make a careful comparison; the result of which is that for beauty alone, apart from permanency, we should decidedly prefer the carbon to the silver prints. Mr. Swan says that the process is now in regular practical operation, and that they are producing such prints as those before us every day. The difficulty of ascertaining the proper exposure in the absence of facility for watching the progress of printing is overcome by means of a very simple actinometer, which we understand answers very satisfactorily.

We feel that the achievement of this end is an occasion of congratulation to photographers. A practical carbon process has so long been the subject of ardent hope, and has been so long a source of hope deferred that many had become disposed to regard it as one of the chimeras of photography, and class it with the production of photographs in their natural colours, and similar processes. It is a subject of legitimate satisfaction and pride to Mr. Swan that he was the first to produce in this country perfect carbon photographs, and that he is also the first to bring the matter to the commercial issue as a practical success.

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A CHAPTER ON EXPRESSION.

BY JOHN E. CUSSANS.

No one will, I think, deny that the most essential point about a portrait is, that it should be a likeness of the individual represented. This is too self-evident an axiom to admit of any argument; it behoves us, therefore, as photographers, to consider what are the most efficient means by which that desirable result can be obtained. I may possibly be met with the objection at starting, that a photograph *must* be a likeness. Against this declaration I must enter a protest. I grant that the image projected on the plate is an exact transcript of the object presented to the lens at the time such image was produced, provided that the mechanical appliances were properly adjusted; but to assert that every photograph is necessarily a likeness is sheer nonsense. Have you néver, professional reader when a sitter has called for his cartes, been uncertain which packet to deliver? Have you never, unprofessional reader, been much exercised in your mind to determine whether you ought to recognize a portrait in the album of a friend, or not? Has it never been your experience to see photographs, in which the subject has been flattered? and have you not times out of number, met with others in which he has been most grossly maligned? Whence arises this seeming paradox? How can a thing be at once like and unlike? Simply because the familiar work-a-day expression of the sitter's face, and the expression he assumes when before the camera, are two totally dissimilar things. But, it may be urged, that is the affair of the sitter, and is beyond the control of the photographer. It is all very well to shift the responsibility on to the shoulders of the much-suffering sitter, but, unfortunately, this notion is, in a great degree, fallacious. I am well aware that it is impossible for a photographer, be he never so skilful, to make a Titania out of a Hecate, but I insist that the operator has it largely in his power to command the expression of his model. The photographer will not find it time lost to try the marvellous changes of expression which he can communicate to a plaster bust, merely by different arrangements of illumination. It is not, however, to lighting that I now wish to direct attention, but rather to a few minor operations, of little moment, perhaps, in themselves, but which, in the aggregate, become of vast importance. "It is trifles that made perfection," said Michael Angelo, "and perfection is no trifle."

The most difficult subjects in whom to secure a good expression are ever those whose features are most expressive. Persons there are on whose faces no appearance of emotion is ever perceptible. They wear the same imperturbable mask under all circumstances. Were they to be informed that, like the lady-bird of the nursery legend, "their house was on fire, and their children at home," the intelligence would probably produce no more outward signs of emotion than the announcement that they had suddenly became possessed of a fortune. Now, nothing in the world can be easier than to make a good likeness of a person of this description. It is far otherwise with those who possess very expressive or mobile features—whose very thoughts are to be seen rippling over their face. The great problem which photographers have to solve is, how to secure that transient, evanescent expression, which constitutes the great charm of individuals of the latter class. I shall give the result of my own experience, which I trust will prove as serviceable to others as it has to myself.

In the first place, do not strive too much after an artistic pose: you may get a good composition, but if you weary your sitter, you will probably fail in obtaining a likeness. Avoid, if possible, the use of the head-rest; and do not let your subject stand in position a moment longer than is absolutely necessary: as a general rule, have your plate ready before you commence to pose. It is hardly necessary for me to remind the professional photographer that every face has some good points, which it ought to be his study to bring out. He must be worse than a Fenian who would ignore this fact, and rather than take the trouble to alter his accessories and illumination, would place his sitter in the exact position occupied by the last, regardless of the difference that might exist between them. Engage him in conversation during the time of focussing, &c., and, if possible, make him do the principal part of the talking himself. Then, when everything is prepared, instead of pointing out a fixed spot on the wall for him to look at, direct attention to some moving object, such as an automaton toy. There is one admirably adapted for this purpose, sold for a shilling. It is a bird, readily fastened by a screw to the edge of a table, mantelpiece, or other similar projection. Under the figure is a pendulum, which, when set in motion, causes the bird to alternately raise and drop his head and tail in a most grotesque fashion. By looking at this, the attention of the sitter is engaged; the cold, stony stare is banished; and his face does not reflect that utter vacuity of mind too painfully manifest in many photographs. There is one highly important precaution that should be observed, but which is frequently neglected; and that is, to place the object to be looked at sufficiently near to the sitter, so that he can see it with ease: if it be too far removed, and the sitter be at all near-sighted, he will screw up his eyes to half their natural size. The result is obvious. If, on the other hand, the object be too close, it is apt to give the appearance of a slight squint.

It is almost superfluous to add that the shorter the time of exposure, the crisper will be the expression on returning from the dark room. Never tell your sitter that he has moved, or that he doesn't look quite as he ought to. Ten to one if you do, the result of the next attempt will be still worse; he will either grin horribly a ghastly smile, or else look like a corpse propped up in the room as if for the operator to perform his funeral service according to the custom of the Greek Church.

Some time since I managed by a little strategy to obtain a good likeness of as difficult a subject as it has ever been my misfortune to encounter. I had exhausted my *répertoire* of "expression dodges." Plate after plate had been tried without success; the negatives were good, regarded solely as mechanical productions, perhaps perfect, yet still the great object for which I was striving was unattained; the photographs were as like the sitter as Hyperion to a Satyr. In the language of the old lady immortallized by Professor Holloway, I mentally "pronounced her as incurable," when as a last resourse I tried, not a box of pills, but a mild deception. Without drawing the dark slide, I went through the pantomime of exposing. During this time my patient wore an expression of suffering that would have warmed the heart of Spagnaletto. Directly I uttered the magic words, "Thank you, that will do!" my sitter was totally changed. A bright, and withal a perfectly natural smile once more illuminated her face, and her eyes spoke, as some eyes will. Before she had time to move from her position, I engaged her attention by recounting some marvellous, and, I regret to say, totally apocryphal adventure; and while she was listening I quietly withdrew the slide, and secured an admirable likeness.

I do not say that portraits taken under these or similar circumstances will always be good as photographs. They must be frequently under-exposed, and will not always be quite sharp (the latter fault, by the way, is sometimes a positive advantage, as in the case of persons who are marked by the small pox; these I always purposely throw out of focus); but if open to objection for these causes, they will nevertheless possess a quality far more valuable—they will be portraits.

I hope I may not be understood to advocate bad photography and inartistic composition as necessary adjuncts to successful portraiture. By no means. No exertion should be spared to render photographs really worthy the title of works of art; but for the attainment of this object, I maintain that faultless manipulation and graceful posing alone are not sufficient.

To many photographers, possibly, these remarks may not appear as strikingly original, or convey much information with which they were before unacquainted; but then a great number of people delight in being told something that they already know—they are pleased with themselves to think that they possess as much information on a particular subject as one who presumes to set himself up as an instructor; but that there are very many who are ignorant of, or at least do not bring into practice, the suggestions I have thrown out, two minutes' examination of a photographic album will abundantly testify.

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ENLARGING.

BY SAMUEL FRY.*

We come next to what is known as the solar camera process, that is to say, by the instrument introduced by Mr. Woodward, the essential principle of which is that a reflector passes the rays of the full sunlight through a condenser, thence through the negative, and finally through a combination lens, producing an enlarged image of extraordinary beauty and brilliance on the screen. Those who have never witnessed this part of the process can have but little idea of the very great power and vigour of the image, the view seen on the ground plan of a camera, under ordinary circumstances, conveying no notion thereof.

The exposure given is just sufficient to produce a latent image, but occasionally there is a faint outward appearance of the deep shades. From the motion of the earth, the mirror reflecting the direct rays requires constant alteration of angle. There is not more than a very few minutes between each change, and this precludes anything like lengthened exposure. On this account it is very important to have negatives specially adapted for this method of enlargement. They should be thin, unintensified iron negatives, and are better not varnished, as the structure of the varnish, unless of very fine quality and carefully applied, is apt to be unduly apparent in the enlargement.

It is not the intention of this paper to go into minute details of the chemical processes, but rather to give such a *résumé* of the qualities and value of each method as shall enable the reader to judge which is likely, in any given case, to yield the most satisfactory result. The latent or scarcely visible image, just alluded to, is developed by a saturated solution of gallic acid, and fixed with hyposulphite of soda as usual. The picture thus obtained is very valuable as a basis for the operations of the artist. When skilfully worked upon in crayon, water-colours, or oils, the result is often very fine; but I am sorry to say that the specimens exhibited to the public have not, taken as a whole, created a very favourable impression. Under ordinary circumstances, the developed solar camera print is not a pleasing picture in its untouched state; the colour is often foxy, and reddish-brown, or else of an unpleasant dirty green, and the uncertainty of development is very great—in fact, one of the most erratic operations photographers have to deal with. The gallic-acid solution in presence of free nitrate of silver rapidly decomposes, and, without extreme care, produces a dirty deposit on the picture that cannot be removed. Nothing but extreme care as to immaculate cleanliness of all the materials employed will enable the operator to produce good results by this method. A primary consideration in this process is the possession of clear, unclouded sunshine, which, of course, in this variable climate, greatly limits the amount of work that can be done; but, in view of this difficulty, artificial light has been used with much success. The oxyhydrogen light used in place of the direct sunshine, and in a large, perfectly dark room, has, in some hands, given fine pictures, but the time of exposure is enormously increased, and the expense of production also; and I think it may reasonably be admitted that, whatever may be said of the sunlight pictures, that it is far better to enlarge from a transparency, as described (ante, 533) than to use artificial light. The characteristics of the pictures are, of course, similar, whether by sun or oxyhydrogen, and have, unfortunately, drawbacks that are very generally objected to; the picture is coarse, and sunk in the paper, besides its ungenial colour. No doubt there are exceptional pictures from very fine negatives and done under favourable circumstances, but I think we can only look upon developed solar pictures, as I observed above, as a basis or groundwork for the operations of the painter. In the next and final chapter on this subject, I shall describe the methods used by Dr. Van Monckhoven to produce his very fine enlargements, and also certain modifications of the same.

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REMARKS ON THE PHOTOGRAPHIC IMAGE.*

BY JOHN JEX LONG.

I may first explain that most of the experiments, the results of which I am about to explain to you, were made in perfect ignorance of the communications that have appeared in the *British Journal*, by Mr. Carey Lea and others, during the present year; but, having since read them and extended my researches, I have been led to modify my opinions slightly on some points, but in the main they are the same.

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* Continued from p. 534.

* Read before the Glasgow Photographic Association, Nov 2, 1865

The extraordinary change caused by the rays of the sun or other sources of light on the sensitized film, and the marvellous resulting image after applying the developer, must be a deeply interesting subject to all who think and reflect as they pursue the photographic art—a subject on which little appears to be yet known, and on which so much has been said during the last few months.

Mr. Carey Lea having founded his theory upon the results of experiments similar to my own, I will first draw your attention to the origin of my experiments—repeating them for the sake of demonstration—and also to the accident that drew my attention more directly to the subject.

From January till June of the present year I had neither read the journals nor entered my laboratory; but, being a great deal in the country in the months of June and July, I exposed a number of Dr. Hill Norris's dry plates, and among some successes I had the usual number of failures, which I threw aside, till the evening of July 18th, when I retired to my laboratory to put things in order, commencing with dirty plates.

I generally immerse my spoiled plates in a bath of nitric acid to dissolve the silver that composes the deposit, and in doing so I observed a plate which, instead of clearing, presented the appearance in every respect of one newly sensitized. It was at once evident that this plate had not been fixed; the iodide of silver being insoluble in nitric acid the image was dissolved off, and the iodide film left unchanged. After washing the plate thoroughly under the tap, I examined the surface minutely, and found no apparent change; the plate looked so perfect it struck me that there might be a possibility of using it over again. I accordingly placed it beneath a muffle I use for printing oval transparencies, and exposed it to the gas, developed with pyrogallic acid in the usual way, when the exposed parts developed freely. I then took a fresh plate (one of Hill Norris's), exposed under a negative eighty seconds to the gas, and developed—the image resulting, of course, as a transparency. I dissolved this off in nitric acid, and restored the plate to its original state. I washed this and set it aside with the other plates for further experiments, making up my mind to throw away no more spoiled plates; for, to say the least, they would do for transparencies.

Next night I resumed these experiments, and proceeded to see how many times I could use plates restored by this process. I had repeated the experiment five or six times, and the film gave way. To prevent this occurring I prepared plates with albumen before applying collodion, sensitized, and well washed under a tap, exposed under a negative, developed the image with pyrogallic acid and silver, dissolved off the image as before with nitric acid; after well washing under the tap, again exposed under the same negative and developed; but to my great astonishment I had two pictures instead of one—one at the top and one at the bottom of the plate, the latter being upside down. This was to me somewhat startling. I immediately prepared another plate in the same manner as the last, exposed under a negative, developed and dissolved it from the film, washed it thoroughly under the tap, and redeveloped without again exposing it. The image reappeared—not quite so dense as the first, but there it was. I dissolved this off again, and reproduced it several times.

Now, these experiments lead to the conclusion that, if the change in the film were a chemical one, the action of such a powerful agent as nitric acid would destroy it, and, after the picture had been removed, a difference in the film would be observable. This did not appear on the dry plates, as I before remarked; but if the film be closely observed, it will be seen that a distinct but faint outline of the removed image can be traced. I have brought a plate that has been treated as described, on which you will see where the image has been; the film appears bluish and more transparent.

Since making the above experiments, I have read with great pleasure several papers communicated to the *British Journal* bearing on the subject, especially those of Mr. Carey Lea, because the results of his researches are so opposite to mine, and yet his manipulations have been similar. As some present may not have seen them, I have thought well to make copious extracts, and point out, I think, how we have had such opposite results, and then, with your leave, will repeat two or three experiments to prove that the film *is* altered by the light and the subsequent development.

The nature of the latent image, the invisible change produced under the developer, and whether any alteration is effected by the light in the composition of the film, are still disputed points, explained and accounted for in different ways by men of great scientific ability, so that it would seem presumption in me to put forth an opinion in opposition to men of such undoubted talent; but I think it beneficial that all who practise the art, however humble their scientific position, should make known the phenomena they notice during their experience in that truly delightful study. I trust, then, you will bear with and extend to me your patient indulgence.

It has been held by some that the iodide film suffers no chemical change in the camera or under development. Mr. Carey Lea says:—

"When iodide of silver is exposed to the light it undergoes a physical change, which causes the portions so acted upon to be more apt to receive the precipitated silver than the parts not so acted upon. . . . Or the change may consist of iodide of silver into a polymeric form."

One of the editors of the *British Journal*, in a leading article of the 26th of May, compares the action of light upon the sensitive surface to the action of a glass rod upon the sides of a vessel containing a strong solution of chloride of potassium and tartaric acid: where the rod touches the glass it leaves a line of crystals along its path, and where the light acts upon the iodide it transmits to it a similar power to attract particles of silver from the developer.

In the same journal Mr. H. C. Jennings writes that he had made some iodide of silver by precipitation of iodide of potassium, and placed it in the light to subside. He found that it had turned a brown colour from decomposition and liberation of iodine, and, after standing in a dark place, the iodine had again combined, and the liquid became quite clear. He repeated the experiment several times with the same results.

Mr. Carey Lea, in another letter to the same journal, emphatically asserts that the production of a developable image in the camera upon the iodo-bromide film is a purely physical phenomenon; that no decomposition of the silver salt takes place, no separation of iodine; and, finally, that in the wet process, as ordinarily practised, the image is *entirely formed at the expense of the developer*, supporting his views by the following experiments:—

"*Experiment* 1.—If any reductions take place in the camera, or even any partial decomposition to be completed in the development in any way at the expense of the iodide or bromide in the film, then the iodide or bromide in the film must be removed to a proportional extent. * * * * * *
In order to settle this point I resolved to develop a plate in the ordinary way, and then, instead of removing the altered iodide and bromide by fixing, to leave them and remove the picture, thus reversing the operation usually performed, with a view to be able critically to examine the resulting condition of the iodide and bromide in the film.

"Clearly, if any part of the iodide or bromide had been consumed in forming the negative, the film would be left thinner in those parts which correspond to the dense parts of the negative, and thus the negative would be converted into a thin, pale positive.

"It was necessary to find a substance capable of removing the picture without injuring the iodide or bromide in the film, and I found that a weak solution of pernitrate of mercury possessed this quality, and it will be seen later with what wonderful nicety it performed its work.

"The developed picture was plunged into this solution very dilute—so dilute that about two or three minutes were required for the complete removal of the negative image.

"The plate was then washed and carefully examined. In none of the plates so treated could the slighest vestige of a positive be found.

"The film was perfectly smooth and uniform, thus forbidding the conclusion that any part of the iodide or bromide had been consumed to build up the negative image, even in exposure or during development."

To make it more conclusive, Mr. Carey Lea repeated his experiments in yellow light with iron and pyrogallic acid developers, with the same result, which he thinks sufficient to *close the controversy*, and adds:—

"The simple fact that this second development is possible at once establishes the existence of a physical change in the film perfectly distinct and separate from any reduction."

From the above extracts it will be seen that Mr. Lea sees no possibility of the image being produced but at the expense of the developer. His experiments were concluded by removing the image from the iodide film with pernitrate of mercury, which may account for his not finding the "*vestige*" of an image in the film.

Pernitrate of mercury has the property of dissolving iodide and bromide of silver in an eminent degree, and therefore it may be considered a *very unsuitable* solvent for the silver precipitate, as, during the two or three minutes it requires to remove the picture, it may be taken for granted that it exerts its solvent power upon the iodide and bromide in the film over its entire surface.

I have here an acid solution of pernitrate of mercury which instantly removes the iodide film; also another in this bottle four times diluted, and even it removes the film in less time than taken by Mr. Lea to remove his image, so that a solution must be very dilute indeed to remove the image and leave the film untouched. Now, as iodide of silver is nearly entirely insoluble in the strongest nitric acid, I think it a much more safe and suitable solvent of the silver picture.

I will immerse this plate with the picture on the unfixed film. The image instantly dissolves, leaving the film unchanged, except where the image has rested on or in the iodide of silver. This exhibits all the characteristic appearance that Mr. Lea says is required if decomposition of the iodide has taken place. It appears thinnest or more transparent where the higher lights of the image were. I think, if I mistake not, that one of the Editors of *The British Journal*, in a recent leading article, September 22, stated he had repeated Mr. Lea's experiments with the same results, and considered them *quite conclusive*—viz., that no decomposition or chemical action takes place in the production of the image.

My own experiments tend to prove that partial decomposition has taken place, or at least some change that renders soluble those parts where the light has acted, while the parts not so acted upon are still insoluble in nitric acid, specific gravity 1·41. But seeing that, after the developed image is removed, it can be reproduced perhaps an indefinite number of times, there must be a remaining power that the acid is incapable of neutralizing. I am strongly of opinion that this property is akin to magnetism or electricity; for, as the magnet communicates its power of attraction to particles attracted, thereby enabling them to attract other particles, so it appears to me the power transmitted to the iodide film to attract particles of silver from the developer is extended to these particles to attract others, and so on till all the silver of a certain compound (not metallic) is removed from the developer, and built up into an image upon the impressed parts of the film.

This rather leads me into the theory of development, but, as the two are so intimately connected, it is almost impossible to separate them. Perhaps if I quote a passage from an article that appeared in the before-named journal, written by Mr. Ramsden, it will give you the best explanation of my ideas of the action that goes on between the latent image and the developer. He considers the deposit metallic silver, and says:—

"I look upon a developer in this light: in a solution of nitrate of silver and sulphate of iron, sulphate of iron is trying to pull silver down, and would certainly do so, but silver calls in to his aid free acid to hold him up, and so free acid holds sulphate of iron in check; but when you introduce changed iodide, he disturbs the balance, and pulls without an opponent, having sulphate of iron for an assistant, and so, between the two dogs, sulphate of iron and free acid, changed iodide gets the bone of contention, or a supply of metallic [?] silver, which he quickly devours and assimilates to himself."

I think this a very common-sense view of the case, assuming that the altered iodide has an electrical or magnetic power to assist in this struggle, and that every atom of silver he recovers from the developer assists him to pull down another, until the strength of free acid becomes overpowered and he gives up the struggle, allowing sulphate of iron to shower down metallic silver with all his strength and will.

The difference between Mr. Ramsden and myself is simply this:—When nitrate of silver and sulphate of iron are contending, I suppose a combination of oxide or suboxide of silver and acid takes place, which is seized by the attractive power of the altered iodide in the film, and collected upon those parts acted upon by the light, continuing to do so till the free acid is consumed. For the moment sulphate of iron gets the mastery. There appears to be no addition made to the picture. I merely suggest this as a plausible theory with a view to induce some one with more leisure and ability than myself to examine it.

In trying to discover the amount of silver deposited upon the surface of an exposed plate, I could not observe any appreciable difference between the weight of a perfectly dry iodized plate before being exposed and after the picture had been dissolved off. To test this I sensitized a plate 3¼ × 3½, washed well, dried thoroughly, and weighed before exposure, and found its weight 515·9 grains; exposed, developed, and again dried, when the weight was 515·95 grains, showing the difference to be only one-twentieth part of a grain. I dissolved off the deposit with nitric acid, washed well, and dried; it then weighed 515·9 grains, exactly the same as before exposure. From this experiment I concluded that the film underwent no change; but the agent producing the image must be magnetic or electric, although my experiments as above show it is most probable that chemical decomposition does take place in addition.

I had intended to extend my researches into the development further, had time permitted. The latent image and its nature, I think, is a subject far from being exhausted; and I trust my bringing it before you to-night may induce some of you to put your shoulder to the wheel and assist to remove the obscurity that yet hangs oven this great and important question. Dr. Vogel says:—

"It is hardly matter for surprise that practice should have found more adepts than theory: that a few philosophers only should have occupied themselves with one, while the names of those who have sought to perfect the other have been legion. It is, however, with me an unwavering conviction that the future of photography depends entirely on the fundamental knowledge of the physical and chemical effects produced by light. It is this conviction that has induced me to resume my researches, and now publish the fruits of my researches in the results I have obtained. I do not despair of being able to dissipate much of the obscurity that has hitherto concealed a great number of photochemical phenomena."

I presume to say that every feeling and sentiment expressed by Dr. Vogel is shared by myself, and it will be to me a gratification to feel that my exertions have in the smallest degree furthered the interests of photography.

Thanking you for your kind attention, I shall be glad to answer any question on points on which I may have failed to express myself clearly. I have several plates with the iodide unremoved and developed, which I shall be glad to operate upon in any way you may suggest.

◆

INTENSE NEGATIVES AND SAVING SILVER.

The Editor of the *American Journal of Photography* gives an important hint on securing intensity, which we very emphatically endorse. He says:—

"A short time ago a photographer of this city sold out the establishment which he had carried on for about one year. Among the effects disposed of was the floor of the dark room. The value of the silver which this dirty looking floor yielded was upwards of 150 dollars. This was plainly a case of carelessness and wastefulness. It is seldom necessary to spill anything, and nitrate of silver, in the vessel that was expressly made to hold it, is more valuable than on a dirty floor.

"The photographer is obliged to handle many things which may be spilled. Some persons seem to consider it a privilege to spatter things about, and they use the privilege liberally. But I have to hear of the first case where any useful result was obtained. Indeed, in photography a spilling and spattering propensity seems to bring along its immediate punishment; stains inexorably follow the heedless and wasteful handling of silver and iron solutions.

"The reckless style of manipulation seems to me to be the origin of a vicious style of developing, which with many has become a habit, and a practice which is sometimes defended. I allude to the dashing on the developer, and deluging the plate with it. Did it ever occur to those who develop in this way, that the developer was needed on the plate and not in the sink? that the silver which might have assisted to strengthen an image is swept away beyond reach? In my opinion, about half the re-developments and strengthenings might be omitted, except for this washing away of the life of pictures.

"The rule ought to be in treating a plate, not to spill a drop of collodion, developer, or fixing. Some may fear fogging, or over development, by following such a system. But let such try the plan thoughtfully, and they will find their fears are groundless. Let them recall their ordinary rules, and the seeming difficulties vanish. If the developer is too active, add acid, or dilute.

"The chief item in my receipt for intense negatives is, Do not spill the developer."

◆

GLYCO-PROTOSULPHATE OF IRON.

BY PROF. TOWLER.[*]

This new developer of Carey Lea's promises to supersede all others that at the present moment exist, for it possesses many important advantages over its predecessors.

In the first place, with this developer, fogginess can be completely avoided.

Secondly, we have no doubt it may be so modified, or the length of exposure and the strength and composition of the developer can be so accurately balanced, as to produce a sufficiently intense negative without resorting to redevelopment.

Thirdly, alcohol and acetic acid, two at present expensive materials, may be placed on the shelf as unnecessary ingredients in the preparation of the iron developer.

These are certainly important advantages; none will dispute the fact. It remains, however, to make the modifications by which the best results can be obtained.

In our own experiments we preferred following the suggestions made by Mr. Nicol, which were published in our last issue; these aim to leave out of the developer acetate of soda, which by decomposition gives rise to free acetic acid. It seems quite possible that free sulphuric acid, surrounded as it is by a solution of gelatine, will become the substitute of acetic acid as a restrainer of the reducing action of the developer; it may be also that the gelatine acts in the same way on the protosulphate of iron—that is, by surrounding each infinitesimally small atom of the reducing salt with a gelatinous film, which thus moderates the action of the salt. We prefer, however, not to theorize at this stage of our knowledge of this new developer, whose virtues, as already known, have excited in our mind the profoundest respect for its author, whose discoveries are chemical deductions, not fortuitous medleys.

We do not believe we have as yet obtained the best formula for the preparation of the glyco-protosulphate of iron, but we will state the results of our experiments so far.

In the first place the solution was prepared as follows:—

Sulphuric acid	1 ounce
Water	2 ounces
Common glue...	4 drachms.

The mixture of sulphuric acid and water is allowed to cool, and then the glue is added and left in a warm place to dissolve. To the solution an excess of clean iron filings or turnings are thrown. By an excess is meant more than the sulphuric can dissolve. An ounce, therefore, will be more than enough, because the combining proportions of iron and sulphuric acid are as 28 to 49; the residue, or undissolved iron, can be used whenever another quantity of developer has to be prepared. An effervescence immediately commences as soon as the iron is added, caused by the liberation of hydrogen gas from the decomposition of water, whose other element—that is, oxygen—combines with the iron so as to produce oxide of iron, which dissolves in or combines with the sulphuric acid. It is possible, too, that a new acid is formed by the action of sulphuric acid on the glue, and that this acid also combines with iron, giving rise to another salt of iron, an organic salt. This double salt of iron in solution, together with altered or unaltered glue in solution, forms the new developer.

The mixture of iron, glue, water, and sulphuric acid are placed aside in a warm place for several days, and in the meanwhile is frequently shaken or stirred up so as to drive off the gas as it accumulates in bubbles on the surface. Owing to the mechanical protection of the gelatine, it is almost impossible to saturate the whole of the sulphuric acid at the ordinary temperature, and it is at this temperature that the discoverer recommends the solution to be prepared. But with frequent agitation, warmth, and time, but very little free acid will remain in the composition. The residual quantity may be removed entirely, if found necessary, by the addition of a few drops of a solution of carbonate of ammonia; but in our own experiments we have not found it necessary to make any further additions.

After the combinations are terminated, and the effervescence has ceased, there will be about four ounces of a dark, tea-coloured solution; this solution was diluted in different proportions, which produced different results in the development.

Three portions of water and one of the solution produced, with the ordinary exposure, a beautiful, clear negative, which required, however, intensifying.

Four portions of water and one of the solution yielded a more intense negative than the former, but not sufficiently intense to be complete.

The exposure was purposely made longer in a third experiment with this latter dilute solution. The result was an improvement.

Five parts of water to one of the original solution produced a negative, the exposure being about double of that ordinarily required, which gradually became more and more intense, until the shades finally were sufficiently opaque for the printing operation. No fogging was visible on this or on any of the negatives subsequently taken with the above proportions.

Several negatives were taken in succession with the developer in its present form. They require no redevelopment. The film is very clean and free from apertures, and resembles in some measure a tannin negative. These negatives were taken from views out of doors.

We took a portrait negative within doors, giving the usual exposure. The result was in every respect very good; the shades were equally dense with those produced by the common iron developer; but there was not the slightest tendency to fogginess. With a longer exposure, probably, no redevelopment would be required.

We prepared another solution in the following proportions:

Sulphuric acid	1 ounce
Water	2 ounces
Glue	2 drachms,

and shall submit it to experiments in the same manner as the preceding. The results we shall report in our next issue.

A third solution is also preparing of the following proportions:—

Sulphuric acid	1 ounce
Water	2 ounces
Glue	1 ounce.

We have, therefore, plenty of work on hand.

As far as we are permitted to form an opinion on this new developer and this modification of it, we are inclined to regard it as the most successful of developers as well as the cheapest. The fact that it requires a longer exposure than the ordinary developer is to be attributed to the presence of free sulphuric acid, which will be removed in some of our subsequent experiments, so that this objection probably will fall to the ground; but, supposing it still exists, is it not better to give this longer exposure—longer by a quarter or so—than spend from five to ten minutes afterwards in redevelopment, in order to get the same opacity of film? Besides, the film, by the action of the new developer, remains smooth and polished; whereas, by intensification by almost all of the known processes the surface is pulverulent, and sometimes so much so as to produce granulated prints.

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[*] From *Humphrey's Journal.*

The new developer flows freely over the surface of the moistened negative, and consequently requires no alcohol.

The new developer is prepared out of very cheap materials, and will probably be soon in the market; in the meanwhile any photographer can easily prepare it himself. Prepare it, therefore, and let us have the benefit of your co-operation.

◆

SPECKS, FLASHES OF LIGHTNING, ISLANDS, LAKES, ETC., ON THE NEGATIVE FILM DURING DEVELOPMENT.

BY PROFESSOR TOWLER.*

There are but few operators who have not been annoyed with the formation of all sorts of markings on the negative film at some period of their practice, so that it is not necessary to describe the peculiar shape of them by which they may be recognized. Each operator will at once say: "I know the fiends."

There is more than one cause that produces them. In answer to one of our correspondents in the last number of the Journal, in reference to these very marks and spots, we gave, as the cause in his case, the irregular concentration of the nitrate of silver during drying, and the formation of streaks owing to the contraction of the silver film and the pendant position of the plate, as also of forms like flashes of lightning, of islands, lakes, &c., owing to the same sort of contraction or drawing together of the silver solution. All these irregular formations can be seen on the surface of the plate before the development is poured on, after the plate has been out of the bath for several minutes, even without any exposure. To see them, the operator needs only place the film in such a position before a faint light as to receive that light by reflection in the eye. Whenever such concentration has taken place, before or during exposure, the result will be, as soon as the sulphate of iron is poured upon the film, that there will be a more energetic reduction of silver on the mottled and marbled marks and streaks than upon the contiguous parts from which the silver has receded. Several accumulations of the silver solution, as it thus concentrates in bubbles, will undoubtedly act also in some measure as so many imperfect lenses, producing a concentration of actinic action on the film beneath.

* * * *

But we have now assigned another cause for the evils in question; it is a very peculiar cause.

For instance, whilst preparing porcelain pictures, where all irregular workings are very distinct by contrast, we have frequently met with marks like flashes of lightning, lakes, ponds, concentric circular spaces, in fine, of all manner of shapes, and upon parts, too, where the light could not possibly reach by reason of the intervening vignette. This phenomenon has occurred over and over again; and we were thoroughly convinced by the precautions taken that light could not reach several of the parts where the spots were located, and futhermore every care had been previously taken to clean and polish the plates correctly before they were flowed with collodion. The problem had to be solved.

The developers used were of two kinds: the first was the ordinary protosulphate of iron developer diluted to half its strength with an equal volume of water, six or eight weeks old, and quite red from the change of some portion into persulphate of iron; the other was the collo-protosulphate of iron—that is, the developer of iron and glue.

After several experiments we found that the developers were the cause of the marks in question. The spots, streaks, &c., did not develop gradually, like the parts of the picture, but came out all at once, in one instant, but not all at the same time. We observed furthermore, that if the first portion of the developer, after the plate had been thoroughly flowed with it, and the picture had partially come out all clear, were immediately poured off, and the plates were flowed with fresh developer, the specks were diminished in number.

We, therefore, retained the first portion of the developer on the plate, and carefully watched the development. The picture appeared, became more intense, and finally the developer became muddy, coagulated so to say, and opaque specks and streaks of apparently reduced silver swam upon the surface. By inclining the plate the fluid portion of the developer rushed downwards to the lowest parts, but the opaque films were left behind, and coming in contact with the surface of the collodion by the posterior edges, the developing fluid gradually receded from beneath them, and left them adhering to the collodion film. No subsequent efforts of washing could remove them. They preserved the same shape on the film of collodion which they had on the surface of the developer.

The experiment was repeated with the same result; and we are now convinced that the decomposition of the developer itself, by its mixture with free nitrate of silver and organic matter, produces a metallic film which acts like that which is produced on water if a little gas tar be thrown into it, and the water be agitated; and furthermore the resemblance is still continued where such water containing the tarry film is poured upon a glass plate; if the plate be agitated and inclined, the water will rush to the lowest corner and drop off, whilst the tarry film will be broken upon its irregular streaks and patches, which, coming in contact with the glass plate, are there retained.

This sort of decomposition is not produced by the influence of light; it is purely chemical, and may be produced on a plate that has not been exposed. The same sort of decomposition is visible on the corners and lowest edge of the collodion plate where the nitrate of silver solution has accumulated during exposure. But in such places the solution frequently has gained access beneath the collodion film and the glass plate, or within the pores of the collodien itself; and, consequently, the metallic film produced by the decomposition can not rise to the surface of the developer, but is kept on the corners and edges.

It is possible that the glairy substance (organic matter) which gradually forms in an old iron developer, and the gelatinous matter in Carey Lea's developer are the causes of the production of the metallic film in the developers; and we shall prosecute our experiments to ascertain the facts. An old silver bath, too, by reason of an accumulation of organic matter, may produce this sort of reduction, even in a freshly made developer of protosulphate of iron.

◆

IRON GELATINE DEVELOPER.

BY M. CAREY LEA.*

Since I first proposed this new form of developer, in which the decomposition products of gelatine by sulphuric acid take the place of acetic acid in controlling the development, a very large number of communications have appeared upon the subject with various though generally very favourable expressions of opinion, and suggestions of endless modifications, all characterized by the same peculiarities which have claimed for these developers, viz., extraordinary plasticity and exemption from tendency to fog. I am now engaged in making some further experiments on the subject, the results of which I expect to publish later. But I cannot refrain from again calling the attention of the large number of persons who appear now to be engaged in experimenting with it, to the fact of the necessity for thoroughly saturating the acid with the iron. I am much inclined to believe that all of those who have really succeeded in preparing the developer have liked it; and that those who have been dissatisfied with its action have not, or have only partially, succeeded in the preparation.

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* From *Humphrey's Journal.*

* From *Humphrey's Journal.*

In my original directions, I spoke of leaving the solution in contact with the iron filings for a few days—agitating, &c. Now a contact of this length of time *is* sufficient, if the whole operation is performed exactly right; especially if small quantities are used; if a very large excess of iron filings be employed, so that the liquid is continually in contact with a large surface of metal; if very frequent agitations be given the mixture; if the whole be regularly diluted afterwards, just as the solution goes on, neither too much nor too little liquid being added.

But unless this is scrupulously done, and with the care which habits of chemical manipulation impart, the saturation will not be complete. And if certain simple precautions be neglected, even a much longer period will not give the desired result.

If, for instance, the mixture has not been kept sufficiently dilute, crystallization will take place, and the crystals may easily so envelop the iron filings and convert them into a solid cake, the solution ceases, or almost wholly ceases. Of course the materials under these conditions may be kept together almost indefinitely without the process advancing.

When crystallization has taken place in this way, it is not sufficient to pour in water and trust to a re-solution taking place, or, at least, a day or two additional must be allowed for this; but it is better to pour off the supernatant liquor, and add a little warm water to dissolve the cake, and when this is effected to pour back the rest.

It is better, however, to avoid this, by diluting a little every day, but not to excess—as, of course, if the liquid is rendered very dilute, the solution of the iron goes on more slowly—and to shake well several times a day. It is also a good plan to use the iron half in filings, half in small tacks.

I have before adverted to the necessity of avoiding a rise in temperature during the solution of the iron. The first portions of water that are added after the gelatine has been dissolved in the acid always produce a material elevation of temperature. Whereupon, some hours should be allowed to elapse before the iron is added. Or, what answers the same purpose, instead of diluting with water, the first time, throw in some lumps of *ice*.

◆

SOLUBILITY OF IODIDES AND BROMIDES.*

Iodide of Aluminum.—Known only in solution.
„ „ *Ammonium.*—Extremely deliquescent. Very soluble in water and alcohol.
„ „ *Arsenic.*—Soluble in a large quantity of water. Soluble in boiling alcohol.
„ „ *Barium.*—Very soluble in water. Easily soluble in alcohol.
„ „ *Cadmium.*—Permanent. Readily soluble in water and alcohol.
„ „ *Calcium.*—Deliquescent. Very soluble in water and absolute alcohol.
„ „ *Cobalt.*—Deliquescent. Soluble in water and in alcohol.
„ „ *Lithium.*—Very deliquescent. Soluble in water.
„ „ *Magnesium.*—Deliquescent. Very soluble in water.
„ „ *Potassium.*—Deliquesce in moist air. Very soluble in water. Soluble in 5½ parts of alcohol, 0·85, and in 39 to 40 of absolute alcohol.
Iodide of Sodium.—Deliquesce in moderately moist air Soluble in 0·39 parts of water at 60°. Very sparingly soluble in alcohol.
„ „ *Zinc.*—Very deliquescent. Soluble in water and alcohol.
Bromide of Aluminum.—Deliquescent. Very soluble in water and in alcohol.
„ „ *Ammonium.*—Readily soluble in water. Sparingly soluble in alcohol.
„ „ *Arsenic.*—Decomposed by water, &c.
„ „ *Barium.*—Very easily soluble in water. Easily soluble in absolute alcohol.
„ „ *Cadmium.*—Deliquescent. Readily soluble in water, alcohol, and ether.
„ „ *Calcium.*—Very deliquescent. Soluble in water. Very soluble in alcohol.
„ „ *Cobalt.*—Deliquescent. Easily soluble in water. Soluble in alcohol and in ether.
„ „ *Lithium.*—Very deliquescent. Soluble in water.
„ „ *Magnesium.*—Deliquescent. Soluble in water and in alcohol.
„ „ *Potassium.*—Permanent. Soluble in 1·18 parts of water at 60°, and in 200 parts of cold alcohol.
„ „ *Sodium.*—Readily soluble in water. Very sparingly soluble in alcohol.
„ „ *Zinc.*—Deliquescent. Soluble in water, in alcohol, and in ether.

◆

Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, November 22nd, 1865.

The French Photographic Society held its opening meeting for the season on the 3rd of November. Some remarkable pictures by Dr. Lorent, and a series of views from the Berlin Exhibition, sent by the Photographic Society of that city, were exhibited, and excited great admiration among the members present.

The interesting paper on "Moving Figures in Photography," read by Mr. Claudet at one of the late meetings of the British Association, and the note on the "Obtaining of Blacks in Heliochromy," recently sent to the Academy of Sciences, by M. Niepce de St. Victor, had been forwarded to the society. We regret that the secretary of the committee contented himself with merely announcing that these manuscripts had been sent in; they were surely worthy of being read.

M. C. Silvy forwarded several pictures obtained with the magnesium light. They are interior views of the vaults of the Chapel at Dreux, which contain the tombs of the Orleans family. These images, which required six or eight minutes' exposure, are very well done; they are proof of the services which may be rendered in such cases by the magnesium light. The lamp which M. Silvy employed was that invented by M. Solomon. Four ribbons of magnesium were required for the production of the necessary light.

M. Leure submitted to the examination of the members some specimens of a new preparation, which he substitutes for albumen, and which may be applied with equal success to paper, to glass, and to canvas. The paper is very white and pure, and may be employed without any change in the ordinary methods of sensitizing, toning, and fixing. The specimens on canvas are very remarkable, and attracted general attention. We think that the application of photography to wood-engraving may derive great advantages from this new coating, the composition of which the author unfortunately keeps secret.

I have before me at this moment some singular photographic pictures. They are caricatures similar to those which Nadar, Carjat, and others used to draw in pencil; big heads on little bodies, grotesque riders upon wooden horses of Lilliputian dimensions, whole rows of the same individual reproduced twenty or thirty times, and stretching from the foreground right away to the horizon. They have an extraordinarily fantastic look, for all the bodies and heads are well executed from nature, and when the images are looked at in the stereoscope, the modelage and the perspective are excellent. It is evident that the effects are obtained by a system of cutting out and successively reproducing, similar to that employed for mosaic cards. They are, however, none the less curious on that account, and prove that the author (M. Leckow) possesses a rich imagination, for the subjects are of infinite variety. M. Leckow must certainly be very expert also to put his witty conceptions into execution so cleverly as he does. By similar methods he likewise produces very original pictures which, on being amplified and transferred to the lithographic stone, admit of being employed in the manufacture of wall-papers.

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* From "Storer's Dictionary of Solubilities."

It is interesting to observe with what facility the photographic art is directed into constantly new applications, and what infinite resources it affords to men of imagination and taste, who make it a docile instrument for the embodiment of their ideas. Ernest Lacan.

PHOTOGRAPHING FOLIAGE.

Sir,—I beg leave to address you on the subject of a communication which was inserted in the Photographic News of last week (page 536), entitled "Photographing Foliage," by Mr. Carey Lea, wherein the author offers a suggestion to employ a pale green glass in the camera as a means of lowering the actinic power of rays proceeding from highly illuminated or white objects, whilst the plate is exposed for a period of time adequate to the proper rendering of foliage or darkly shaded objects in the same picture. This idea occurred to Mr. Crookes and myself nearly ten years ago, when we were engaged upon certain "Methods of Preserving the Sensitiveness of Collodion Plates," and not only did we try pale green and other tinted glasses, but used green media in the shape of solutions applied to the plate. We considered this method would be available as a means of preventing solarization under the difficult circumstances already alluded to; but it must be rememberd that a longer exposure will be necessary even for the trees, inasmuch as the green rays proceeding from foliage are intensified by the admixture of a considerable proportion of more highly refrangible rays, which likewise suffer a diminution in value whilst passing through a green medium.

I append an extract, dated April 14th, 1856, from our paper as printed in extenso in the *Philosophical Magazine* for May of that year:—"Finally, we have employed with excellent results the nitrate of nickel * * * and also the double nitrate of nickel and ammonia, a salt possessing deliquescent properties, and apparently equally suitable for our purpose. The colour of this agent, bright green, suggests the possibility of employing it with advantage in cases where green foliage has to be represented in juxtaposition with objects reflecting more active photographic rays."—I am, sir, yours, &c., John Spiller.

Royal Arsenal, Woolwich, Nov. 15th, 1865.

GELATINE IN THE PRINTING BATH, &c.

Sir,—In reference to the remarks of the "Photographer's Assistant" in your last issue relative to the gelatine bath, as to his formula refusing to go through the filtering paper, and his conclusion that it makes no difference, as you can put it through muslin, I would observe that too much gelatine is not so good as the proper quantity; the surest test of quantity is found in the filtering. If the bath at 60° Fah. will not go through the filtering paper, there is too much gelatine; if this solution, which will filter at 60°, should get thick below that temperature, put out your bath in your floating dish over another containing hot water, and use the bath thus warm. This is now our second autumn with this bath, and this plan of hot water we again resort to, not having found a better way.

In regard to his remark that "the addition of liquor of ammonia is unnecessary," and that "fuming answers infinitely better," I must say that, in my experience, I must insist that liquor of ammonia is necessary and beneficial, and that fuming alone, in my hands, does not produce so good results; and, if my experience as the inventor of this process is of any weight, the particulars as given by me in your Journal, I believe, must be fully carried out. This I remark because the many pluckings will alter the compound we guarantee to give results worthy of being appreciated. At the same time I shall be delighted to see the experience of others fairly recorded, so that every phase of working may be presented to the profession, thus adding to its usefulness and quality. Let every one tell his own experience; let the original remain to be fairly and by many tried before you attempt to strip him of his usual clothing, to place on him the shroud to the burying. Let any rear what they please on my idea; but I cannot see the devastating hand interfere with my photographic pleasures, the organic bath being one, without defending that which has served me well. Your correspondent makes allusion to gelatine and silver held in suspension, with which and more I am fully acquainted, and have been for some considerable time, and I have brought it to a practical issue, and communicated it to the *British Journal* in October last, with specimens of the results, to which they advert in their issue of Nov. 10th; and the reason of their not mentioning it before was, that I had not till then given my consent for them to do so, to which they can testify. There seems a peculiar strangeness in his letter being dated the 6th, there being four clear days before you published on the 10th, which did not contain an allusion to the communication dated the 6th, nor was any thing said till the 17th, one week after. I had said my medium was without ether or alcohol. There would not be much difficulty, I think, in concluding gelatine to be the medium I used. Although I should rather drop my pen altogether than make any conflict of this matter of priority of invention. The prints enclosed are produced from the same batch of paper and solution as those sent to the *British Journal* a month since. The solution keeps well. To-day I have succeeded splendidly with opal glass, so that now I am perfect on paper and opal glass. The field open in this direction is great, and embraces paper, ivory, opal glass, canvas, wood, and stone by the bichromate of potash process for printing with ink, also for the dry plate process for taking negatives, &c. I have for some time had canvas and paper on order in London especially for this process, and believe I shall as easily succeed with that as with what I have already tried.

You can, therefore, see that the suggestion was anticipated, and has an existence in a decided process, adapted and proved in two particulars, viz., paper and opal glass.—Yours truly, John Palmer.

58, *and* 68, *Union Street, Stonehouse,*
Nov. 20th, 1865.

[We have felt it necessary to curtail our correspondent's letter, which is already lengthy, because, being hastily written, it contained much repetition, and also contained some remarks calculated to excite angry feeling. Regarding modifications, it is of necessity always understood that each person in describing a process or its results means in his own experience. When he says "this is good and that is bad," he necessarily implies "in my experience." This should always be understood, as its constant repetition would become tedious. In a brief record of our own experiments, given on another page, it will be seen that we found a less quantity of gelatine, and the presence of ammonia, beneficial. We attribute this to some different conditions in our case, probably the quality of the gelatine; but this does not lessen the value of the suggestions of the "Photographer's Assistant," which may be just suited to the conditions of other workers. No novelty was ever perfected without the co-operation of many workers, and we are always obliged to intelligent correspondents who furnish us with their experience. Our own collodio-chloride process has been the subject of various suggestions which we have published with pleasure. Mr. Palmer, it seems, has just made a radical modification in substituting gelatine for collodion, and if it be found an improvement, no one will be better pleased than ourselves. With regard to the letter of a "Photographer's

Assistant," the date of which troubles our correspondent, it was a private letter which we received more than a week before we published the extracts, which we thought might be useful to some readers. The suggestion of the use of gelatine instead of collodion is so obvious that it had been made to us a score of times within a few weeks after we announced our discovery. Mr. Palmer will find it publicly made by the Chairman of the North London Photographic meeting in March last by referring to page 153 of our present volume. We tried it about that time, with the result described in an article on another page, which was just written when we received the above letter. Our experiments with gelatine have not been successful. If Mr. Palmer has found a method of using it successfully, the value of his labours will consist in his success, and not in the mere idea of using gelatine, which many persons had previously suggested. We shall look with interest for further details of the method, for on referring to the announcement made in our contemporary a fortnight ago, we find that no particulars of the process are published. The prints enclosed appear in all respects like albumenized prints, and when tested present the same characteristics. When we know more of the process, we can speak of them more fully. Does Mr. Palmer pour his gelatine preparation on the ordinary albumenized paper?—Ed.]

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Photographic Notes and Queries.

Blistering of Albumenized Prints.

Sir,—One of the nuisances with which a photographer has to contend is the blistering of his albumenized prints. Having been much annoyed by this defect myself, I hit, some time since, upon a plan which almost entirely prevents it. It is a well-known fact, that when any spongy substance is saturated with a dense solution of a salt, and placed in water, or in a weaker, and therefore more rarefied solution, an interchange takes place, the outer solution becoming stronger, and the solution in the fabric becoming weaker, until at last an equilibrium is established, and the two solutions become of the same strength. On this depends, of course, the washing of photographic prints, or, in fact, that of any other substance.

The violence or rapidity of action in this case would, of course, depend upon the degree of difference between the densities of the two solutions.

Blistering seldom or never occurs until the prints are taken from the fixing bath and placed in water for the purpose of washing, when it comes some times instantaneously.

Now mark what occurs. The fixing bath is a dense solution with which the prints are thoroughly saturated. On being put into water, a sudden effort is made by the hypo to get out of the print, and an equally sudden one on the part of the water to get in; the result is, the print, in the scene of action, becomes "blistered." The following therefore is the simple remedy which suggests itself:—On taking the prints out the hypo instead of putting them into a large quantity of water (as is usually done), let them be placed in a dish containing a small quantity of water, rendered at least as dense as the fixing solution by the addition of a sufficient quantity of common salt. They should then be placed under a tap, and a small stream allowed to dribble on them of water. By these means the solution external to the prints suffers a continual but gradual dilution, and all violence of action is avoided. After having been washed in this way for from half an hour to an hour, they should be transferred to the washing machine, and the last traces of hypo removed in the usual manner, the solution in the prints having become so dilute by these means as to be no longer capable of blistering them.

Hoping I have not wearied your patience, I am, sir, yours truly,

R. Smith, Junior.

Nov. 20th, 1865.

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Talk in the Studio.

Mounting Prints.—A correspondent, Mr. Roberts, of Hereford, says:—"The following is a good material for mounting, and will keep three or four weeks:—White wheat starch, three tea-spoonfuls, beat into a paste with cold water; 1 oz. of best Russian glue, dissolve in boiling water half a pint; while boiling pour on the starch; put into the saucepan; and boil until it is as thick as treacle. When cold a piece can be melted with a little warm water till thin enough for use. I can mount quicker with this than anything I have used yet."

Printing Frames for Opal Glass.—Messrs. Ottewill, Collis, and Co., referring to our recent remarks as to the want of a printing frame for opal glass with more conveniences than any we had seen, write to say that they exhibited a frame for the purpose at the North Eastern London Exhibition. They add: "Our frames admit of large negatives being printed upon small opal plates, or small negatives upon large opal plates, and the process of printing can be examined without detriment to either negative or prepared opal plate." That exhibited at the North London Exhibition was very excellent so far as it went; but if we remember rightly it was only intended for one size of negative or of opal glass. We have not seen any of those which admit of various sizes being used. Since the article referred to was written, Mr. H. P. Robinson has designed a printing frame for the purpose which appears to meet every requirement perfectly.

Collodio-Chloride on Paper.—Mr. W. Britton, jun., of Barnstaple, of whose collodio-chloride pictures on opal glass we spoke highly in our last, sends us a charming and rich print on paper, and makes the following observations:—"I have no doubt collodio-chloride is destined to play a very important part in the future of photography. No one can look on a good opal glass picture produced with it without acknowledging that photography is raised many steps higher by the introduction of collodio-chloride, and the thanks of all photographers are due to you for the free gift. The formula I use for paper is as follows:—

Mix three stock solutions—

No. 1.—	Nitrate of silver	1 drachm
	Distilled water	1 ,,
No. 2.—	Chloride of calcium	64 grains
	Alcohol	2 ounces.
No. 3.—	Citric acid	64 grains
	Alcohol	2 ounces

Now to every two ounces of plain collodion (I use Perry's of Sheffield, but I have no doubt other makers will answer equally well) add 30 drops of No. 1 solution, previously mixed with 1 drachm of alcohol; then 1 drachm of No. 2 solution gradually, shaking well at the same time; lastly, 1 drachm of No. 3 solution. In a quarter of an hour it will be fit to use. The picture I now send you was printed with solution mixed about an hour." As we have said, the print is in all respects charming.

The South Light.—Mr. L. Vanderbie gives, in the *American Journal of Photography*, his eight years' experience with a south light. He says:—"My operating room is 28 by 12 feet, the skylight 10 by 12 feet, glazed with 130 10 by 12 inch common window panes. The lower end is 8 and the upper end is 12 feet from the floor, facing direct south. To screen the sun I have used first blue cambric, but that took too much light. Then, taking that down, I covered the glass with a coat of blue frosting; but that reduced the light so much I had to scrape it off. After that I made a screen of blue tissue paper pasted together and all around with a strip of blue cambric, with rings on the top and below, and through which passes a wire across the light, so that I can shift the screen on any side, or take it entirely out of the way. I place the sitter facing south directly under the top of the light. I can give any light and shade, also any position at any time, to my subjects by shifting my screen either way; by allowing a little sunshine on one side, I get a very strong and powerful negative. By reducing the light, I get a very soft and mild one. In cloudy weather I shift the whole screen one side. I can take negatives at any time, no matter how cloudy it is. I have my dark room on the south end, and do all my work there. There are shelves on both sides of my sky-light, on which I do my printing. The only objection I find against a southern sky-light is in the summer, that it is too hot, and in cloudy weather (that is, unsteady, sunshine one minute and clouds two or three minutes) it is very troublesome."

Photographic Christmas Cards.—Mr. H. Taylor, of Brighton, sends us a prettily designed card produced by photography, with a small oval for medallion portrait in the centre, and Christmas and New Year's greetings around, intended for a Christmas or New Year's gift.

PHOTOGRAPHY AND ARTISTS.—On Saturday evening last, at the Associated Arts Institute, Mr. O. G. Rejlander read a paper on the Uses of Photography to Artists. The paper was illustrated by a very large number of transparencies—some enlargements, others reductions—from the better known of Mr. Rejlander's productions. Besides a number of studies from the nude, he also exhibited a large chalk drawing of Mr. Brougham, the eminent actor, made from a small photograph. In the course of his paper Mr. Rejlander called particular attention to the value to artists of an enlarging apparatus for the amplification of small sketches, and exhibited, in an arrangement of his own, some enlarged transparencies by the aid of magnesium wire. The paper was well received, and at its termination an animated discussion followed. The prevailing impression amongst the artists present seemed to be that photography, except in the hands of those who knew how to use and not abuse it, would have a tendency, especially in the hands of young students, to induce idleness and a neglect of the severer studies so important to those who aimed to reach the highest rank in art.

PORTRAITS OF TENANTRY.—We have just had our attention called by Signor Vervega to an interesting mode of cementing the bonds between landlord and tenants on a large estate. Captain Palliser, of Comragh, gave a commission to Messrs Davis and Co., of Clenmel, to photograph the whole of his peasantry, 115 in number, each tenant being supplied with a copy of his own portrait and that of his parish clergyman. Amongst the photographs taken two are of persons who have lived over one hundred years each on the estate, an old man and an old woman, who look well and hearty, and make excellent pictures. Signor Vervega, who undertook the duty, informs us that he was also engaged to photograph all the scenery on the estate, which is very fine. He was engaged during fourteen days continuously; he employed the gelatino-iron developer with great success. His reception amongst the farmers was very gratifying. From the portraits of the two centenarians and some other charming pictures he encloses, he appears to have been very successful.

PHOTOGRAPHY IN NATURAL COLOURS.—Let us see what the existence of such a photographic process would imply. There must be a sensitive surface capable of assuming all hues. This in itself it would not be easy to find. But more than this: each coloured light must cause the surface to assume its own exact tint. Now in the case of a single colour, say green, it seems to me that this could only be a coincidence. It would be as reasonable to suppose that a green substance—a green wax candle—should burn with a green light, as to suppose that a green light should produce a green substance. Of course it might do so; but there is no reason for believing in any necessary connection. At this rate photography in natural colours would require an infinite number of coincidences. But I would go further. Granting that the process were discovered, I say it would be impossible to work it. For since the surface is by supposition sensitive to light of all colours, it must be prepared and finished in absolute darkness. Now I have no hesitation in saying that if the new process were as delicate as the present one (and it could scarcely fail to be infinitely more so) it would be impracticable to work it in darkness. The difficulty is evaded now by working in a yellow light, to which the film is not sensitive. Taking these considerations into account, I am not at all sanguine about photography in natural colours.—*Hon. J. W. Strutt.*

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To Correspondents.

R. S. T.—Sometimes the defect you name—the solution running in greasy streaks on taking the plate from the bath—arises from the collodion having been made with very highly rectified solvents, which repel the aqueous solution. In such case the addition of a drop of distilled water to each ounce of collodion will often prove a remedy. Sometimes it arises from the condition of the bath. One of the best remedies is to move the plate frequently up and down or in and out of the bath, and to leave it in sufficiently long for ether and alcohol in the film to become thoroughly saturated with the bath solution.

E. E. CANEN.—Mr. Newman, of Soho Square, supplies a preparation which, when mixed with water colours, permits repeated applications of colour without disturbing that already applied. You will find particulars in the work we reviewed a few weeks ago "On Harmonious Colouring applied to Photographs."

R. GORDON.—We will bear the fact in mind, and let you know should they be required.

WM. G. GROVE.—Mr. Hardwich published in various editions various formulæ; we cannot give you the reference to the one in question; but it is immaterial, seeing that the details were published along with the reference. Should the question possess some special interest to you we will inquire.

R. R.—If you had sent us a whole print or a few prints, instead of about an inch of one, we might have been able to form a better opinion of the matter; but from your description we are unable to determine the cause of the transparent spots. They may proceed from a variety of causes. The most probable cause is turbidity in the bath, caused by some particles of foreign matter, which, floating in the solution, attach themselves to the film, and so cause spots. They may be caused by the materials with which your plate is cleaned, particles of which, lodging in small hollows on the surface of the glass, will sometimes cause spots. Sometimes spots are caused by the use of an over-iodized bath, in which case changes of temperature will cause or prevent spots.

GEORGE ANDREWS.—The position your portrait lens should occupy on a magic lantern depends on the focus of the condenser you employ. The portrait-lens should be placed so that the image of the flame employed is brought to a focus by the condenser on the front lens of the portrait combination. The slides will be nearly in contact with the condenser. The position of the light will be regulated by the condenser, but a very little experiment will suffice to show when you get the best illumination. 2. Where rapid work is required in dull and cold weather, you may use a fifty-grain iron solution, with about twenty minims of glacial acetic acid. 3. The lime-light has been used successfully for enlarging by development up to life-size.

PALETTE.—Much depends on the position and the amount of glass employed as to which kind is best. As a rule we prefer plain sheet glass; but if the studio be large, and a large portion of it be glazed, we might then use plain sheet for the side-light, and the rough glass for the roof. 2. We believe Baxter's prints are copyright, but are uncertain. There is no legal wrong in copying unregistered photographs; it depends on circumstances as to whether there is moral wrong. 3. A picture of card size may be copied full size with a good quarter-plate lens. 4. When the gelatino-iron becomes old and inactive, add an equal bulk of a plain 20-grain iron developer to it.

A. M.—There are various modes of printing on artist's canvas, all of which, however, require skill and practice to succeed. The best which has been published, so far as we know, is that by Mr. Charles Waldack, which appears on p. 138, of the present volume of the PHOTOGRAPHIC NEWS. Our collodio-chloride of silver process may be used, provided a very powdery and adherent collodion be used, which will not crack off.

H. J. KNIGHT.—You must add ammonia until the free sulphuric acid is quite neutralized; the amount will depend on the strength. 2. The optician you mention is a French one. Your only mode of obtaining satisfaction as to the quality of the lens will be to try it.

UN LECTEUR.—It is improbable that you will find many of the technical terms used in photography in any French Dictionary; that of Spiers is one of the best for scientific terms generally.

PHOTO-BUILDER.—So far as we can judge from the circumstances described, the business should be successful, but we cannot give efficient advice on the subject. 2. Such a studio would probably let well; but on all questions of or relating to commercial matters we abstain as much as possible from comment, as a personal knowledge of each individual case would be necessary to the formation of an opinion of any value. 3. The general plan you describe seems very good; neither end need have any glass. 4. The situation appears to be good. 5. The proportions, 26 ft. long and 11 ft. wide, appear good; we should have preferred the height to have been about 14 ft. at the ridge and 9 ft. or 10 ft. at the ledge, if it had been convenient. 6. You may with propriety have 5 or 6 ft. at each end, opaque at each side, and as much or more opaque at each end of the roof. The glass in the sides should reach within a foot of the ground. 7. We should prefer the panes of glass to be larger than 14 inches by 10 inches. 8. For card pictures a good card lens will answer best, and with a room 26 ft. long, you can work one of the best, which will have a focus of about 8 inches, and require about 20 ft. between the lens and sitter.

COLOURING AND RETOUCHING ENLARGEMENTS.—We have been favoured with communications from several artists who, referring to a recent remark in our "Echoes of the Month," state their willingness to undertake commissions and also to forward specimens. We shall, of course, at all times have pleasure in seeing good work, and to recommend any that appears to us to be deserving; but it is necessary to state that our contributor referred to a general and oft-expressed want in metropolitan circles; but that we should not have facilities for bringing individual photographers and colourists into communication. The modes in which artists can make known their capacity and willingness to undertake commissions are various, such as sending specimens to exhibitions and to meetings, exhibiting specimens at the establishments of dealers, and occasional announcements in our advertising columns. We are glad to learn that there is so much ability available for such work, and ready to meet the requirements of photographers.

Several Correspondents in our next.

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Photographs Registered during the past Week.

MR. A. CLARKE, Ripon,
  Portrait of the Dean of Ripon.
MR. A. F. FISK, Woodbridge,
  Photograph of Sydney Sussex College, Cambridge.
  Photograph of Great Court, Trinity College, Cambridge.
  Photograph of Clare College and Bridge.
  Photograph of Ely Cathedral.
MR. B. GOBBI, Stamford,
  Photographic View of Stamford.
MR. J. H. BURKE, Capel Street, Dublin,
  Photograph entitled "The Shamrock."
  Photograph entitled "The Rose, Shamrock, and Thistle."
MR. J. PATRICK, Liven, Fife,
  Portrait of Dr. Russell.
  Portrait of Miss Marsh.
  Portrait of Lady Anstruther and Children and Miss Marsh.

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THE PHOTOGRAPHIC NEWS.

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WOODBURY'S PHOTO-RELIEVO PRINTING PROCESS.

Mr. Woodbury, who has for some time been energetically engaged in overcoming all the mechanical difficulties of his photo-relievo printing process, has now attained such a high degree of success, that he can, without hesitation, submit his results to the public. In accordance with a resolve made from the first discovery of the process, he will do so first through the Photographic News, and our readers will therefore receive the first published specimen of the process. We have, accordingly, to announce that unless unforeseen and insurmountable circumstances intervene, we shall, on Friday, January 5th, 1866, or as early after as possible, present our readers with a genre picture by this process, the subject probably being a "Mountain-dew Girl at Killarney," from an original negative by Mr. H. P. Robinson. Of the perfect gradation, richness, vigour, and general beauty of this process, the picture itself will be the best illustration. Of its economic value the details which we shall publish, when the print is issued, will furnish the most striking proof. For the present we forbear remark, beyond observing that, in an economical sense, it appears to us the most important discovery which has been made in connection with photography.

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HOW TO CHOOSE AND USE THE NEW IRON DEVELOPERS.

As in every community, there are amongst photographers a few extreme conservatives, some extreme radicals, and, it is to be hoped, a large number of prudent, moderate men, who, readily accepting all real improvement, reject change unless change involve progress. We refer, of course, to science, and not to politics. The recent introduction of a new power in the development of negatives is one of the occasions which call into activity the tendencies of each class to which we have referred, and it is, perhaps, worth while to enquire for a moment into the real nature of the advantages claimed for the new method, to ascertain what drawbacks accompany these advantages, and to consider under what circumstances the new developers are of undoubted value.

A few years ago the negative developer in almost universal use was pyrogallic acid. The two important advantages possessed by protosulphate of iron, in virtue of which it gradually, but completely, superseded pyrogallic acid were that, being more energetic, it yielded negatives with much less exposure, and that more detail, greater softness, and delicacy were secured by its use. Moreover, by its adoption the processes of development and intensification became separated. If the action of the pyrogallic acid developer were continued to bring out detail in deep shadows the process of intensifying went on at the same time, and the lights often became chalky whilst the shadows were obtaining detail. If iron were used, detail could be secured by continued development without the lights becoming too dense at the same time, whilst the necessary printing intensity could be secured by a distinct process, thus affording a much larger control over the character of the negative than could be obtained in a process in which intensification and development proceeded together. These undoubted advantages secured by the use of the iron developer were gradually recognized by all photographers, and its adoption became universal. The drawbacks which accompanied it were the fact that, when using it, in some circumstances a thin grey image only could be obtained, which it was difficult to intensify, and that, in consequence of its reducing energy, fog was more imminent unless great care were used.

Various attempts have been made from time to time to retain the good qualities of the iron developer, and secure, at the same time, a more dense image by combining some of the organic qualities with the inorganic developer. In many hands saccharo-sulphate of iron served this purpose; in others it failed to give sufficiently increased vigour. Mr. Carey Lea then proposed a method of preparing a double salt of iron and gelatine by which any degree of intensity could be obtained, and in this respect the new developer proved a complete success. The two faults of the iron developer, then,—grey images and fog—were got rid of for ever. Various modifications of Mr. Lea's process followed; the chief one was to secure greater simplicity in its preparation. The two distinct modifications which typify most of he others, and which are, so far as our experience goes, the best in themselves, are those of Mr. Nelson K. Cherrill and Mr. Jabez Hughes, both of which have been described in our columns. The developer made by Mr. Cherrill's method most nearly resembles, in constitution and result, that of Mr. Lea, but is more easily prepared than the solution first proposed by that gentleman. The developer prepared by the method adopted by Mr. Hughes, although arising out of the suggestion of Mr. Lea, is really in constitution scarcely allied to his formula at all, but much more nearly belongs to the saccharated iron solutions already in use.

The question then arises, are the advantages claimed for the new forms of iron developer absolute improvements of universal application, unaccompanied by any drawback which limit their use?

We have already received various answers. Some of our correspondents and friends have already expressed a conviction that they are not. These are amongst the photographic conservatives. In photography, as in politics, conservatives are generally found amongst those who have met with success in existing institutions. They allege that in the old and simple form of iron developer they find everything they desire; they secure a perfect image, without fog, which readily acquires any degree of vigour they desire, on the application of the usual intensifying solutions, and that the method they have employed for the last few years gives them more perfect control over the character of the negatives than can possibly be secured by a developer yielding intense negatives at once. They further allege that what is secured in intensity is lost in sensitiveness, a much longer exposure being necessary with the new developers than with the old. In short, they complain that the use of the new developer is a retograde movement, going back to the old pyrogallic conditions. It is to be remarked, however, that those who assume this position are generally the gentlemen who adhered with the utmost tenacity to the use of pyrogallic acid, and only adopted iron when its use had become almost universal.

Another class object to the new developers on the ground that they can already secure sufficient intensity with iron alone whenever they require it, and that in their hands the organic iron solutions give them hard over-intense negatives.

There is, of course, but one answer to these arguments; wherever success is obtained by the old method, there is no need for change. But even in such case, there is a certain advantage in the possession of an additional power. All the modifications of the new iron developer permit the addition of nitrate of silver without decomposition as perfectly as the pyrogallic acid intensifier, so that the solutions may be valuable to them for intensifying, if they are not employed for developing; and the new power is in their possession whether they have occasion to use it or not.

Another class of photographers have already declared in favour of the new developer, and have already adopted some one of the modifications proposed which, in their hands, has been successful. On their behalf, further suggestions are unnecessary.

But there is a far larger class whose experience with the ordinary iron developer, whilst not entirely unsatisfactory, is not such as to place them beyond the desire for improvement, if it be within their reach; and having little time or inclination for protracted experiment, they will ask anxiously if the promised improvements are gained without corresponding drawbacks? if the developer which works without any tendency to fog will bring out as much detail with as little exposure? and if the intensity is gained without any loss of delicacy? If these questions be satisfactorily answered; they will then ask which of the proposed modifications will give the best results with the least trouble.

None of these questions can receive an absolute and unqualified answer; but certain general facts may be stated which each one may easily apply to his own case, so as to secure satisfactory results. We answer unhesitatingly that in the organico-iron developer recently proposed an unquestionable power is gained, in some of the forms of which almost all photographers may secure an absolute advantage.

In the aceto-gelatine iron developer of Mr. Hughes, which is one of the simplest of the modifications arising out of Mr. Carey Lea's suggestion, we believe the chief advantage is due to the physical condition of the solution produced by the presence of the gelatine. Without any alcohol, the developer flows in one steady wave "without haste and without rest" over the plate, removing the necessity, if not the risk, of spilling a drop. An immense advantage is gained here. Some photographers in their anxiety to cover the plate rapidly with the old solution, knowing that if a pause occur in its flow a stain will follow, contrive to let at least half the quantity poured on the plate flow off at the opposite corner, carrying with it a large portion of the free nitrate which should have been retained on the plate to assist in securing a vigorous image. To compensate for this they retain the developer longer on the plate, and thus often induce fog. Hence, in such hands, a feeble grey image, with a slight tendency to fog in the shadows has been of common occurrence. The presence of gelatine changes all this; all the free silver is retained on the plate, the operation of development is slow and under control, without any tendency to fog, permitting a considerable amount of intensity to be obtained by the first application of the developer. To those who are not anxious to secure printing intensity at once it is quite easy to pour off the solution into the developing cup, and examine the plate at leisure without risk of either streaks, stains, or fog arising, they may then renew the operation of intensifying either with the same solution or with pyrogallic acid and silver if they require it. To the most inveterate admirer of the old iron developer this method must at times possess advantages, especially where a large plate has to be covered and stains avoided.

We believe that with this solution made fresh the exposure is not in any degree longer than is required for the ordinary developer. But an important fact must be borne in mind; commercial gelatine is a body of most uncertain constitution, and the proportions may require varying, more or less being added as the result may indicate. With some samples the solution will be limpid with as much as three grains to a pint, whilst with others it will be gelatinous with half that quantity; and whether it be due to the physical character of the solution, or to some chemical action, the gelatine seems to hold in check the energy of the developer in proportion to the quantity present, somewhat similarly to acetic acid. *A priori* many would be disposed to believe that the presence of gelatine, like the presence of sugar, in an uncombined state, would have no chemical effect; but as we have shown that sugar, honey, molasses, &c., exercise a very decided restraining action it is possible that the gelatine may act in a similar manner.

In using the gelatino-iron of Mr. Carey Lea, or the admirably simple modifications of it, first proposed by Mr. Cherrill, and since worked out by the gentleman himself, and also by Mr. Cooper,* in which glycocine is added to the iron solution, other conditions are involved. Here an organic salt, which readily enters into combination, is employed, which exercises a very powerful influence on the process of development, and on the result gained; and an enormous power is placed in the hands of the photographer. Properly used, whilst it checks fog, and gives a richer and more non-actinic character to the image, it does not necessarily prolong exposure or destroy delicacy. If used in excess, however, prolonged exposure will be necessary, and too much intensity may be easily produced. In using this preparation, some judgment will be required to regulate the proportion to the circumstances of working. An admirable and somewhat unexpected aid to delicacy in this preparation is found in the use of formic acid. We had an opportunity, a few days ago, of inspecting some negatives by Mr. Cherrill, taken under the same circumstances, with the same exposure, and developed with the same preparation, some with and some without formic acid, and we were much struck with the wondrous accession of delicacy in the latter.

The greater the range of power possessed, the more important it becomes to exercise it with judgment. In using the developer, where the conditions favour intensity, very little of the glycocine should be added, and formic acid may with advantage be also employed. Where great intensity is required, as in reproductions; where the circumstances tend to produce a feeble image; or where prolonged development or intensification is necessary, the proportion may be greater, in just such degree as circumstances demand.

We have on former occasions entered fully into the use of saccharated iron solutions, and we need only say here that in character and results we have found them very similar to the aceto-gelatine solution of Mr. Hughes.

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* Mr. Cooper has recently favoured us with a portion of the salt formed by the action of sulphuric acid on gelatine, in the form of a powder, a small portion of which is to be added to the iron solution. This is a most convenient form for use; but we have not yet had time to try it.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

The Use of Gelatine in Photography—Mr. Swan's Carbon Prints—Mr. Woodbury's latest Specimens—The Meeting of the Photographic Society of London—The Societies—The End of the Year.

The gelatine mania appears to have taken possession of photographers, and in the eyes of many it is becoming indispensable for the production of negatives and the prints from them. It is right that important subjects should be carefully investigated. If any advantage is to be obtained from the use of organic matter in the developer, the subject has fallen into the right hands to be thoroughly elucidated, and very great credit is due to Mr. Hughes, Mr. Cherrill, and Mr. Cooper, for the energetic manner in which they have worked out Mr. Carey Lea's original suggestion. For my part, and I speak with the caution due to limited trial, I have not been able to discover all the virtues that are said to reside in this new addition to the developer, and from conversations I have had with several photographers who have produced famous work this year, I don't think it will be much used by those who have succeeded thoroughly with the old iron developer. The advocates of the new doctrine say that it produces a rich blooming non-actinic colour in the negative, and not the leaden grey deposit they have been in the habit of obtaining with the old solution. It is on the latter statement that the followers of the old method differ from the new; they say that in their hands, and I may add in mine, that the old developer, properly understood, gives a deposit of a light brown colour sufficiently non-actinic for all purposes, and they claim for the old more sensitiveness than they find the new to possess.

The new developer has one advantage over the old, and so far as my (at present limited) experience with the new solution goes, the only one, it runs more evenly over the plate, and allows more time for consideration in development; in this it is very like the old pyrogallic solution, but its greatest advantage is that many photographers who have never been able to avoid grey images when working by the old method, will now be able to obtain a good colour with more certainty, but with perhaps a little loss in sensitiveness.

Gelatine in the printing bath is another matter of interest that has been brought forward lately by Mr. Palmer, of Stonehouse, and has been commented upon with his usual ability by "The Photographer's Assistant." I have had a little experience with it, and have been surprised at the extreme vigour that can be obtained from a twenty-grain silver bath, containing only a minute portion of gelatine. In one particular, my experience differs from that of others. The first sheets prepared were perfectly white, and remained so, and in perfect condition for more than a week. When I came to prepare some more paper two days after, I found that the solution was discoloured, but not so much so as would be objectionable in an ordinary bath not containing gelatine. A slightly discoloured ordinary bath does not sully the whiteness of the paper to any appreciable degree, and what little it does disappears in the hypo; but with the new bath the papers prepared were of a light brown colour, which remained persistent, none of the after operations removing it. The "Photographer's Assistant" says, "Should the bath become discoloured, no matter; the first washing will remove every trace of its effects." The discrepancy possibly might occur in this way: my bath contained some liquid ammonia, as recommended by Mr. Palmer, while the "Photographer's Assistant" advises that it should not be added. As we know that alkaline conditions tend to such discolourations, this may possibly account for my experience.

A few days ago I saw in the possession of the Editor of the News some prints from 12 by 10 negatives by Mr. Bedford. Casually glancing over them I thought them by far the finest prints from those particular negatives—and I have seen a considerable number—I had met with. Singularly delicate, and light, and atmospheric, these photographs had an effect that puzzled me. When I found that they were printed by Mr. Swan by his carbon process, and heard that these were not picked specimens, but the commercial prints which were being produced every day, I rejoiced greatly. Irritatingly imperfect as all other carbon processes I am acquainted with have been, I have always had hope of Mr. Swan's method, but I was beginning to fear that he had given it up, perhaps from some difficulty in the process, or perhaps because it could not be made to "pay." It is very gratifying to hear that neither of these suppositions was right, and that this admirable process is in full operation at Mr. Swan's establishment.

Last month I spoke so enthusiastically of Mr. Woodbury's improvements in his process that I have exhausted my vocabulary of praise, but then the specimens I then saw were so good that I did not expect I should be called upon to say anything about still better examples, although I then stated that the inventor did expect to surpass them. Well, he has done so, and I am barren of words in which to express my delight at his latest efforts, including examples from every branch of photography—portraits, studies, landscapes, architectural subjects, and microscopic objects.

The first meeting of the Photographic Society of London for the session was held on the 14th ult. The supply of entertainment for the meeting, the largest I ever remember, was excessive, papers by Mr. Mayall and Mr. Jabez Hughes being down on the list for reading. Preceding the serious business of the evening a little episode occurred—or, as Artemus Ward said of his twins, not one episode, but two episodes. As Mr. Mayall was about to commence his paper, a member got up and intimated that he wished to make a statement in reference to the way he had been criticized by the *Journal* of the Society. The Chairman very naturally objected to an irregular interruption of important business, whereupon, after some sharp words, the gentleman left the room and the Society, amidst cheers the reverse of complimentary in their tone and intention. Another person attempted a similar irregularity, which not being permitted, *he* found it desirable to retire. Nobody seems to know or care what the bother was about;[*] but all combined in admiring the firm and manly conduct of Mr. Glaisher in the chair. Order having been restored, Mr. Mayall proceeded with his paper, "On the Construction of a Photographic Glass House," which elicited a long and animated discussion, which lasted till half-past nine; and there was Mr. Hughes's paper still to be read. A brief discussion arose as to the propriety of postponing it. The chairman therefore put it to the meeting, whether the author of the paper should proceed. The show of hands resulted in a tie, there being eighteen for and eighteen against. It was finally decided—unwisely, I think—to read it; for by hurrying the paper through at a rapid pace, many of its numerous beauties of style were lost, but which must be appreciated by his readers. I ought not to omit to state that Mr. H. Cooper also had a paper on a similar subject, which it was decided should be taken as read, and the discussion of the subject postponed.

An interesting feature of the evening was the number of photographs laid on the table for exhibition. No less than three sets of Alpine views—severally by Messrs. England, Stephen Thompson, and Frith—claimed the admiration of the meeting, and illustrated the value of the three kinds of lenses that have been brought prominently before the public recently—Dallmeyer's new wide angle lens, the triple lens of the same maker, and the new wide angle doublet by Ross. All were so excellent, that comparison of the results, so far as they were due to the lenses, seemed impossible; and I for one am content to thank the optical competition which has placed such excellent instruments in the hands of photographers. Mr. Mayall's capital enlargements decorated the walls, and a number of Simpsontypes, by various hands, showed that this process is coming into general use. Quite the sensation-pictures of the evening were some deliciously beautiful landscapes, cabinet size, by Mr. Russell Manners Gordon. I had seen some of these pictures already; but a well-known photographer, to whom they were quite new, on calling my attention to them, expressed his belief very seriously that they were a "caution" to old hands: and I quite agree with him. They are so novel in effect, so charming in feeling, and so lusciously transparent in texture (I don't know how else to express it), that they came upon me like a new revelation in photography.

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[*] Dogberry, in "Much Ado about Nothing,"—significant title!—does not mince the matter in preferring a charge of slander. Here is an example from Act V. Scene 1.

"*Don Pedro.* Officers, what offence have these men done?

"*Dogberry.* Marry, sir, they have committed false report; moreover, they have spoken untruths; secondarily, they are slanders; sixth and lastly, they have belied a gentleman; thirdly, they have verified unjust things; and to conclude, they are lying knaves."

The next meeting will take place on the 12th, and will be of more than usual interest, Mr. Woodbury having undertaken to read a paper on his "New Photo-relievo Process," and to exhibit the mode of working. Most subjects can be made more interesting by good illustrations, but to see this process in actual operation for half-an-hour will be a rare treat, and it is to be hoped that no other subjects will interfere with the successful demonstration of this, by far the most important process, economically, that has been introduced to photography for years.

In the absence of a paper at the meeting of the North London Association, a very interesting conversation took place on a variety of topics — Woodbury's process, with specimens; the new developer; and dry photography. Mr. Ackland promised a paper for his important modification of the Fothergill process for the next meeting.

The South London meeting was exceedingly interesting. Mr. Blanchard read a capital paper on the "Importance of Art-Culture to Photographers," which deserves to be read and studied again and again by photographers seeking improvement. One passage especially should be committed to memory. It is this:—"I firmly believe that there is still a greater future for photography. It is true that colour is shut out from us, but when we remember that the painful labour of years is needed to produce a first-class line engraving, the question comes home strongly to us, have we thus far thrown enough self-denial and earnestness into our labours? We possess such unusual facilities for the perfect rendering of minor details; so much painful labour is spared us, that I do think that with the same amount of thought bestowed by the engraver on his work, and a tenth part of the patience, we should produce something that would be recognised by all as a worthy product of so wonderful a discovery as photography."

The meeting taking place in the Gunpowder Plot week, was appropriately brought to a conclusion by a pyrotechnic display of a very actinic light by Mr. Taylor.

The proceedings of the provincial societies have been very uninteresting during the month, nothing of sufficient importance to justify comment in this column having taken place.

This is the last paragraph I shall write this year. When, at the request of the Editor of a Journal from which I have gained much that was instructive and interesting, I consented to gossipabout matters photographic, with which a moderately long life in glass-rooms, dark-rooms, and tents had made me technically familiar, and a roving life amongst photographers, in photographic meetings, and other places where those interested in our art do love to congregate, had made me socially familiar, I said at the outset that I might be garrulous, and possibly tedious, as it is not uncommon that old age should be. I had hoped also that an old man might speak plainly at times, when plain speaking seemed necessary, without offending, knowing that I never intended any offence, however much at times I might be tempted to, not unkind, candour. I fear some have seen more in my garrulous remarks than I ever dreamed of, and credited me with intentions which never entered my mind. I am perhaps in error in saying that they credited *me* with, for amongst the most amusing matters connected with these Echoes which have reached my ears have been the conjectures as to the personality of the writer, and I have heard the names of various worthy gentlemen confidently cited, each as being without doubt that of the "Old Photographer." I would apologize to those gentlemen who have thus had honours thrust upon them which they had not won, and which I presume they did not desire, if I thought that any act of mine had conduced to single them out as the authors of my gossiping paragraphs. Perhaps a friendly apology all round might do no harm. Christmas is coming, and what a delightful thing it is at that festive season to love one another! To those gentlemen upon whom my errors have been visited I apologize for what I have not done; to those gentlemen who have found offence in my remarks I apologize for what was not intended; and to the long-suffering Editor, who has had most to do for me—especially in forwarding to my address the numerous consignments, the nature of which I need not particularly mention, which have been addressed to the "Old Photographer" at the office of the News—to the long-suffering Editor, I say, I apologize for a variety of things, "too tedious to mention." Who else? I am so difficult to offend that I don't remember any one who requires forgiveness; so for this year

> My task is done * * * my theme
> Has died into an Echo * * *
> * * * * * *
> The torch shall be extinguished which hath lit
> My midnight lamp—and what is writ, is writ,—
> Would it were worthier.

THE NEW DEVELOPER.

BY NELSON K. CHERRILL.[*]

In considering this evening a few of the advantages to be derived from the use of a new developing solution for negatives, introduced by Mr. Carey Lea in America, it will not be necessary, in the first place, to describe to you all the experiments which have been made and published in the hope of effecting some simplifications and improvements. I may describe, however, one formula for the developer with which most of the plates I shall have to show were taken:—

120 grains weight of gelatine (Nelson's patent was used) are placed in a thin glass beaker, and one ounce each of water and sulphuric acid, previously mixed and cooled, are added; when all the gelatine is dissolved, or in about twelve hours, the solution is to be poured into about five times its bulk of water, and then rendered very slightly alkaline with liquid ammonia; the resulting light brown solution may then be made up with 500 grains of protosulphate of iron and sufficient glacial acetic and water to form 15 to 30 ounces of developing solution, according to the strength required. The quantity of acetic added will vary according to circumstances. I use about 300 minims to the above quantity.

A few words on the nature of the solution thus formed, and I must pass on to the more important branch of the subject.

Gelatine treated with sulphuric acid forms, by its own decomposition, a substance known as "glococine," or "sugar of gelatine." This substance, though doubtless mixed up with many other products of the decomposition—about which there does not seem to be any very definite information attainable—is said to enter into combination with the other salts in solution; if this is correct it is probable, but by no means certain, that a triple salt would be formed between the sulphate of glycocine and the ammonia sulphate of iron, in which case, I suppose, you would have to call it an ammonia sulphate of iron and glycocine.

The solution made by the above formula, when used, flows very readily over the plate, and develops the image with greater intensity than the ordinary solution of iron.

A general, though not universal, characteristic of this developer is, that the length of time required for its proper action is about two or three times as long as that required for the ordinary form.

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[*] Read at the West Kent Literary and Photographic Society, Nov. 22, 1865.

The advantages to be derived from the use of a solution of the nature of the one just described may be classed under two heads—first, mechanical; and second, chemical.

Firstly.—Of the mechanical advantages it will not be necessary to make many remarks; every practical photographer who has given the oily gelatinous form of developer a fair trial will, I think, be prepared to allow that if no other advantage were to be obtained, it is a matter of great convenience (especially in hot weather or with an old bath) to be able to be quite sure of pouring on the developer in one unbroken wave, thereby avoiding at the outset of development a great tendency to stains, &c. Many photographers under the old system seem to consider that some serious disadvantage accompanies the use of alcohol in the developer. The mechanical advantage just mentioned is open to one slight disadvantage, viz., if too much gelatine is used, or under some peculiar condition of collodion, a stain will be formed at the point where the stream of developer first comes into contact with the plate.

This may be avoided by using less gelatine solution in proportion to the total quantity of developer, or more sulphuric acid in the gelatine, or by more careful manipulation. In some cases also stains may be formed which show, by their form and position, that they arise from the gelatine solution not mixing properly with the nitrate solution on the plate, before the development is set up.

Secondly.—Of the resulting effects of this developer. It is scarcely probable that the whole question of the *advantage* gained in practice can be fully answered till next photographic season. Comparative experiments made at this advanced time of the year, when the condition of the daylight is very far from favourable for producing the best results, are not very good guides to summer practice, but as far as can be determined at present there is every reason to believe that when once the formulæ are properly understood, and the result made certain in all hands, some modification of a gelatine developer will at least, in a great measure, supersede the old form of the proto or ammonio-protosulphate of iron.

I shall now for a few moments endeavour to point out to you *one* consideration which is, I think, the main or ultimate advantage to which we may look forward, and which is in part already accomplished—that is, that the density or intensity of the finished negative may be made right with one application of the developing solution, and that the intensity may be regulated at pleasure by a slight alteration in the developer before its first application to the plate.

Before attempting to show in what way this may be advantageous, I will refer to one or two theoretical considerations touching photographic negatives and their production by the methods now in use.

In order to represent nature with any degree of truth in monochrome, it is imperative in almost every case that the highest light in the picture should be pure white, and that in the shadows there should be some pure black. The white and light colours of nature are much more brilliant than white paper, and the blacks and dark colours are very much darker than the blackest mark we can make on paper. From this it is clear that even if we could graduate a photograph from the purest black tone to white paper, it would be still wanting in force. But when we consider that photographers generally consider that a rich warm brown is dark enough to do duty for shadow, we lose much of even the limited scale of gradations which can be obtained by the use of paper. Compare a first-rate engraving with almost any photograph from nature, and see the difference in depth. Again, let it be granted that from white to brown is "scale" enough for a picture, the question is, does the present mode of work give us the full benefit of even this short series of tones.

Though many photographs by the present solutions are very beautiful, and many very nearly or quite perfect, yet I do not think that the solutions employed for their production are such as give the best possible chance of giving perfection. I will try to explain the reasons.

Suppose that a landscape to be represented by photography be gradated in nature so that when rendered in a true photograph 10,000 different tints would be required to form the complete and perfect picture. Of course the terms "true" and "perfect" here are used in a relative sense, the black in our "perfect" photograph being taken at some dark shade of brown—that is, by a perfectly transparent portion in the negative. Suppose, then, that a plate is exposed to this view and developed with a solution which, by the nature of its action, begins its operation on high lights of the picture, the usual instructions for development being that when the detail in the shadows is out the developer is to be thrown off and the plate washed, &c. Suppose, then, that these instructions are followed, and the resulting negative brought out for examination. If, as almost invariably happens from a variety of circumstances, the lights of this negative are not intense enough to print quite white—*i.e.*, will only print in our scale of gradations up to 9,000 instead of 10,000—we must intensify till they have acquired sufficient opacity; that is, we must raise the whole series of gradations on the negative 1,000° in order to make that which was before 9 become 10,000.

But in doing this we must remember that it is impossible to add detail to the ultimate blacks of the picture—*i.e.*, the bare glass—and consequently in a print from this finished negative the first tone above the black will be 1,000°.

Though I have here taken, perhaps, a rather exaggerated case, I think that the principle which I wish to point out will hold good under all circumstance, viz., that if you break the development, and have to begin again with it, you cannot, with any of the solutions heretofore used,* add detail in the shadows in proportion to the density gained in the high lights.

The way in which the new developer meets this difficulty is given in a few words by Mr. Wharton Simpson, in reporting on a sample of the solution about a month old. He says that the intensity increased as fast as the detail made its appearance, the only fault being excess of intensity.

The same solution, if used within a few days of its preparation, would have been found to give just the right intensity, more or less depending upon the collodion and other circumstances. I may here remark that nothing is more easy than to modify the result with this solution. If we want less intensity we can use :—

1. A stronger solution, as pointed out by Mr. Simpson.

2. Less of solution of glycocine in proportion to the strength of iron.

3. By the addition of a few drops of formic acid.

Or, without making any alteration in the developer, by using more bromide in the collodion; or by a longer exposure, in which case, however, more glacial acetic will have to be added to the developer.

Again, nothing can be simpler than to alter the solution so as to give more intensity.

1. By using a weaker developer.

2. By using more glycocine in the developer.

Or without altering the developer, by using more iodide in in the collodion.

I may remark that, as a general rule at this time of the year, the solution as given first with about 200 ounces of water and 300 minims of acetic acid, with a quite neutral bath, will give the best results.

There is another point of importance which must not be left unmentioned, viz., that any reasonable amount of silver may be added to the solution during the development, and that such addition acts in a great measure not only to increase the intensity of the high light, but, at the same time, to bring up much detail in the shadow. A very considerable amount of detail will make its appearance as soon as the silver is added.

In conclusion, it is necessary to add that while, with a solution which may be so conveniently modified to suit all circumstances, it will, in all probability, be easy to produce some effects which were before almost impossible, it will require the full knowledge of photographic manipulation, as gained by our best men, to bring out the advantages of such a combination in all its power, and that in the meantime, though white skies and chalky foregrounds may be easily avoided by a comparatively small amount of photographic knowledge, yet a solution capable of giving unbounded intensity may produce a somewhat curious result in the hands of men who do not "know what they have to do," nor "how to do it."

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* It is but right here to remark that the American gentleman to whom we are indebted for the invention of the organic iron developer, has published a method of intensification to be effected by a change of colour in the negative.

THE SCIENCE OF A RAY OF LIGHT.*

BY PROFESSOR TOWLER.†

REFRACTION.

It was shewn, in the last article on this subject, that there is a constant ratio between the sines of the angles of incidence and refraction, whatever may be the magnitude of the former angle. There is no exception to the rule as long as two media alone are in consideration. The pretended exception, when transmission becomes impossible, is not valid, because refraction becomes transmuted into reflection. This property, that is, the limit of transmission, will be thoroughly investigated hereafter.

Now it is evident that, if the line called the sine of refraction be regarded as unity, one inch, one foot, or one anything whatever measuring length, and this *unity* being the division or denominator of the fraction, the quotient will naturally be equal to the sine of the angle of incidence; but however much the divisor or the sine of the angle of refraction may increase or diminish, the sine of the angle of incidence changes in a corresponding manner, so that the *quotient never changes.*

Hence this quotient or ratio is said to be equal to the sine of the angle of incidence when the corresponding refracting sine is *one;* this immutable ratio is also denominated the *index of refraction,* because it indicates how much a given transparent medium breaks a ray of light from its course.

The index of refraction is, therefore, generally assumed as synonymous with the *refractive power* of a transparent medium; and for all practical purposes it may be so regarded; but, rigidly speaking, the values of the two expressions are neither equivalent nor proportional to each other. The absolute refractive power of a medium is that power which the ultimate atoms of the medium are supposed to exert in breaking the rays of light; and on the supposition that the ultimate particles of all bodies are equally heavy, it is evident that the density of a medium becomes a coefficient in measuring the absolute refractive power. Without going more into detail on this subject, which our readers would scarcely be able to understand, we will simply insert here the formula by which the absolute refractive power of any medium can be obtained. Thus, let r represent the index of refraction, then substracting *one* from the square of r, and dividing the difference by the *specific gravity* of the medium, the quotient will represent the *absolute refractive power* of the given medium.

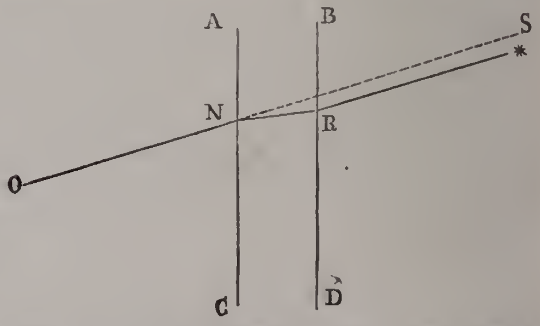
But, as before observed, the index of refraction indicates the relative refractive power of a medium without reference to the ultimate particles that constitute the medium, and is of great importance to the practical optician. The medium, which is assumed as the standard for measuring the indices of refraction, is a *vacuum.* The table here appended gives the indices of refraction of the given media for rays passing from a vacuum into those media; but if we wish to ascertain the relative index of refraction between the two media, all that we have to do is to divide the index of the medium into which the ray passes by the index of that from which it passes.

For instance, if it be desired to ascertain the index of refraction for a ray passing from air into any medium in the list, we divide the index of the medium by 1·000294, which is the index of refraction of atmospheric air.

Table of the Indices of Refraction for a Ray of Light passing from a Vacuum into the different Media here given.

Chromate of lead (maximum)	2·974
,, (minimum)	2·500
Sulphur, native	2·115
Carbonate of lead (maximum)	2·084
,, (minimum)	1·813
Felspar (Spinelli)	1·764
Chrysoberyl	1·760
Nitrate of lead	1·758
Carbonate of strontia (maximum) ...	1·700
,, (minimum)... ...	1·543
Boracite	1·701
Anagonite (of the ordinary‡ ray)... ...	1·693
,, (of the extraordinary‡ ray) ...	1·535
Calcareous spar (ordinary ray)	1·654
Calcareous spar (extraordinary ray) ...	1·483
Sulphate of baryta	1·647
,, (ordinary ray).. ...	1·620
,, (extraordinary ray) ...	1·635
Colourless topaz	1·610
Topaz of Brazil (extraordinary ray) ...	1·640
,, (ordinary ray)	1·633
Anhydrite (extraordinary ray)	1·622
,, (ordinary ray)	1·577
Euclase (extraordinary ray)	1·663
,, (ordinary)	1·643
Flint glass (maximum)	1·605
,, (minimum)	1·576
Quartz (ordinary ray)	1·548
,, (extraordinary ray)	1·558
Crown glass (maximum)	1·534
,, (minimum)	1·525
Sulphate of lime	1·525
Saltpetre (maximum)	1·514
,, (minimum)	1·335
Sulphate of potassa...	1·509
,, ...	1·495
Sulphate of ammonia and magnesia ...	1·483
Carbonate of potassa	1·482
Spermaceti (melted)	1·446
Albumen	1·360
Ether	1·358
Aqueous humour of the eye	1·337
Vitreous ,, ...	1·339
External coating of the crystalline ...	1.377
Middle ,, ,, ...	1·379
Central ,, ,, ...	1·399
Entire crystalline	1·384
Water	1·336
Ice	1·310
Air	1·000294
Vacuum	1·006

From what has already been observed, it will be evident that, if a ray of light pass from one medium into another, with plane surfaces, and then again into the same medium; it will be equally broken, but in opposite directions, that is, towards the perpendicular in one case and from the perpendicular in the other. Thus, in looking through a square of plate glass in the window, at a star, we do not observe the star in the position it would occupy if the square of glass were not interposed.



Thus, let A B C D represent a piece of plate glass with parallel plane surfaces, * a star, and O the eye of the observer. One of the rays of light from the star infringes on the surface of the glass at R, where it is broken from its original direction upwards, and passes to N, at the opposite surface of the glass, where it is now broken downwards, the refraction being equal in the two cases, but in opposite directions. The final direction of the ray is NO. By reason of these two refractions the star is not seen in its true place; it has been displaced, in fine, elevated from * to S, being now seen in the direction ON. If the plate be removed, without taking into consideration the refraction of the atmosphere, the star would appear in the direction of a straight line drawn from O to S, that is, in its true place. But between the star and the observer there is, it is true, no plate of glass under ordinary circumstances of observation, but there is that which is equivalent to a plate of glass with some slight differences; there is a layer of atmospheric air with concentric surfaces, and of variable density.

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* Continued from p. 473.

† From *Humphrey's Journal.*

‡ These terms will be explained hereafter.

The surfaces being concentric, are homologous in their action to plane sufaces; but the variability of the density produces a fracture at each layer of different density; and, since the density changes at each moment, or is continuously changing, so in like manner is the refraction continuous; and hence the direction of a ray of light through the atmosphere is not a *straight* but *curvilinear* line.

The nature of the curve depends upon the nature of the density; and since the density of the atmosphere depends primarily upon the force of gravity, which varies inversely as the square of the distance from the centre of the earth, we have here two components acting upon the ray of light, one of which is the primary impulse in a straight line from a radiating point, and the other the gravitating force producing a density in the air, varying inversely as the squares of the distance from the centre of the earth. The resultant of two such components is known to be not a straight line, but a curve denominated a parabolic curve, the same curve in which a cannon ball is deflected, either ascending or descending, so long as the direction of the ball is perpendicular to the surface of the earth. By reason, then, of atmospheric refraction, the heavenly bodies, such as the moon, the planets and the stars, are never seen in their true positions in the sky, unless they happen to be in the zenith or directly over head.

The amount of this displacement of a star by means of refraction, is a variable quantity; for directly over head, or in the zenith, the star is seen in its true place, the amount of displacement being zero or nothing; whereas in the horizon the star is elevated more than half a degree, or the 180th part of the angular distance between the horizon and the zenith. In consequence of this atmospheric refraction, the disc, both of the sun and the moon, is completely seen before either of these bodies has risen above the horizon. This phenomena is equivalent to placing the eye on a level with the surface of a flat table, and seeing an object at the opposite edge of the table at a time when the self-same object is wholly below the surface of the table top. Between the two extremes of half a degree's displacement at the horizon, and zero at the zenith, we have a quantity varying continuously from a maximum at 0° to a minimum of 90°, consequently varying in one respect as the cosine of the altitude of the star. For the astronomer and the navigator a table has been constructed, indicating at a glance the amount of displacement by atmospheric refraction at any altitude whatever in the quadrant of observation.

From the fact that objects are displaced from their true position when the rays of light emanating from these objects have to pass through other refracting media than atmospheric air, is to be traced the peculiarity of the old English law which entirely nullifies the evidence of a deed seen through a pane of glass. According to this law a witness might depose having seen the perpetration of a murder; but if the visual rays from the perpetrated offence had passed through a window before they reached the observer's eyes, the evidence would be null and void. This naturally was one of the absurdities of the law, indicating that the law-givers had not drunk sufficiently deep of the Pierian spring; they had gulphed the rudiments of science without mastication. The refusal or denial of such evidence would be equivalent to that of the existence of the moon when seen through a window.

Atmospheric refraction is sometimes very irregular, owing to the admixture of moisture and to the different temperature of intervening parts. This irregularity gives rise to very interesting phenomena denominated by the English *looming* and the French *mirage.* It is only a week ago when we ourselves were treated with one of these grand spectacles of nature. From the foot of Seneca lake looking south, and near the eastern shore there is an opening in the hills that bound the eastern and western shores, by means of which the horizon is bounded by water. On the day in question the atmosphere was hazy, and the day sultry; there was every indication of a of a thunder storm. We were waiting for the arrival of the steamer from Watkins, and seeing no indications of its approach, we rode along the northern shore to pass away the time. The appearance of the lake was very changeable; at one time the middle of the distant water near Long Point rose up and gradually obscured the promontory from view, whilst the two continuous sides of the ridge were dark and deep, but no steamer was yet visible in the horizon; after a while, over this ridge of water appeared in the sky above the mountains of the background, the black chimney stacks and the white addle-wheel boxes of a steamship, beneath this a dark space and then an inverted steamer dipping apparently down to the watery ridge below. It was impossible for some time to descry any motion in this towering mass; in half an hour it gradually diminished in size; the smoke-stacks were no longer projected against the heavens; and that which before appeared to rise into the sky sunk down into the placid water below, transmuted into the well-known S. T. Arnott of our beautiful Seneca lake. We recognized in this phenomenon, a case of unusual refraction and reflection, called *mirage,* such as have been frequently observed elsewhere before, though seldom, if ever before, on this lake. On this occasion there was sufficient cause for such a phenomenon. In addition to this spectacle, we observed a small propeller crossing the lake from the Ovid-landing, as we supposed, to Dresden; when the propeller reached the middle-ridge, it appeared to ascend a mountain, then on the summit to be projected against the heavens, leaving a dark space below; during the whole time the propeller was double, which was owing to a boat in tow, as we are inclined to believe; but there was no appearance of an inverted propeller. At the time when the steamer appeared to be projected against the sky there was no steamer visible in the water beneath; in fact, the steamer which produced these phenomena, may have been totally out of sight, being at a distance of eighteen and twenty miles. Such phenomena can easily be accounted for by one thoroughly versed in the variable condition of the atmosphere, and the laws of a ray of light impinging upon such a changeable medium or passing through it; and they might undoubtedly be more frequently observed, if a careful investigation were made in their search at the proper time and place. and with suitable atmospheric conditions.

THE STORY OF A CARTE DE VISITE.*

Dear Mr. Editor,—Knowing you to be tender-hearted, ready to sympathize with the afflicted, and to comfort the sorrowing, I beg you to act as my amanuensis, that I may leave to the world a record of my eventful life. Being faded and worn, you will have to bear with me patiently, and catch my story as I am able to gasp it out. It may teach some of the careless a lesson, and show them that although our number is great, and our name legion, the process of our creation is not uninteresting, or without trouble, and that we should not be despised, trod upon, and maltreated as we are.

We have heard that you human beings are created from dust. You seem to be satisfied with this, and neither trouble yourself about the *kind* of dust or the matter from which it is made; therefore I shall go no further into the details of my creation than to say that I first saw light in the beautiful and extensive manufactory of Herr M. A. Steinbach, Fabricant de Papier, Malmedy, Prussia, as a piece of beautifully white paper. I need not tell you how I was pressed between hot rollers, sized, trimmed, and then laid with four hundred and seventy-nine other sheets maltreated in the same way, nor how we were nailed into a box, with nails harder to draw out than the truth from some of the witnesses in the conspiracy case at Washington, nor of the long and tedious voyage across the tempestuous ocean, and the narrow escape we had from being thrown overboard in a storm, for all this you can imagine as well as I can describe it. I first saw light in this country in your most fashionable *salle photographique.* After the box I rested within was opened, I was taken from the company of the other four hundred and seventy-nine sheets, pinched, shaken, held up to the light so that the cruel artist could see "Steinbach" on my border, and then whirled up a winding-stairs through rooms light and dark, and, terrified and alone, laid down. Presently I observed a huge white pan filled with some curious substance, neither sweet nor beautiful. I heard the artist say it was *albumen,* and that hundreds of diminutive chickens were spared the trouble of coming to life, as many matronly hens deprived of the care of an extensive brood, and myriads of worms and flies spared a chase across the field in the mouth of some courageous chick with a dozen rivals after it full tilt, that this albumen might be made on which he was about to let me float as did our sturdy ship upon the sea. I trembled at such a fate; but presently he seized me by my corners, and, with a dexterous move, laid me flat upon the disgusting surface, which convinced me that the eggs of which it was made must have been very *near* chickens before coming into present hands. Not content with this, he took a rounded rod, and gently pressed me down in every place to give me a thorough dose. He allowed me to remain about five minutes, and seizing me again, threw me cornerwise over a round bar, where, sick and fainting, I was allowed to collect my scattered thoughts, while the superfluous albumen scattered down my sides, and slipped off my corners into a trough below. Presently my four hundred and seventy-nine sisters were brought in, treated likewise, and when we were all dry and stiff, were again placed together, put in a huge press, and squeezed in a manner violent and impolite enough to cause any virtuous female to blush; but there was no help for us. Being rather obstreperous and indignant, I succeeded in getting one corner out, which the artist did not discover until when about to leave the room, and then he wickedly remarked that for my pains I should be the first sheet used, and the corner sticking out should be first victimized. He would go prepare the negative, and then come after me. What is a *negative?* thought I, and concluded I would find out. Looking about me with my little corner, I observed a small dark room, with only yellow glass to let in a little light; in it were two men stalking around like demons, one with a little lamp in his hand, lighting the other, who was cleaning a piece of glass with something from a bottle labelled "Rotten Stone." I heard them say they were making a negative. The room seemed to be very clean and nice, and in perfect order. Bottles, and brushes, and funnels, and other articles were there in abundance, and all properly labelled, and in a special place where they could be found when wanted, without trouble. This enabled me to find out and tell you more than I should otherwise be able to do. After cleaning the plate, and carefully brushing it over with a wide camel's hair blender, the shining glass was seized by one of these gentlemen, and a coating of a very odoriferous creamy substance poured over it, allowed to flow evenly over the surface, and the surplus run off at one corner into a bottle labelled "Collodion," which was made of

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* From the *Philadelphia Photographer.*

Ether	5 ounces
Alcohol	5 „
Iodide of ammonium	50 grains
Bromide of potassium	20 „
Pyroxyline	50 to 60 „

As it may be of value to your readers, I will reveal all I learned in this way, and add that I overheard that in making this collodion, the bromide of potassium should be dissolved in the smallest quantity of water possible, and the iodide of ammonium dissolved in the alcohol; then the ether should be added to these, the whole mixture filtered, the pyroxyline added, and when dissolved, allowed to settle, and the whole again filtered. After the coating of the glass, it was quickly placed upon a long, forked arrangement, and lowered into a deep, narrow, black box, which was labelled "Silver bath," and directions for making on the label were as follows:—

Nitrate of silver	1 oz.
Distilled water	12 „
Iodide of potassium	2 grs.

Dissolve the iodide in one ounce of water, and add it to the silver solution. Stir a few minutes, and filter. Now add a few drops of C. P. nitric acid diluted to the strength of one ounce of water to ten drops of acid. Add the acid until the solution turns blue litmus paper slightly red after remaining in it about one minute, and then filter for use. In less time than I have been telling you this, the glass was removed from the bath, and quickly placed in another black-looking affair, smaller than the bath, and having a little door, which was shut so suddenly that I could not discover how the glass looked after the treatment it had received. The operator, as I am told such persons are called, seemed in great excitement, and ran out of the room with the whole affair. Then I heard the rumbling of wheels, the crying of children, ringing of bells, blowing of whistles, an occasional "Now!" "Look! look! look! look! look! look!" the whistling of birds and several other strange noises that quite overpowered me, and I began to fear something dreadful had happened, until the operator returned to the dark room with a smile on his face. He opened the little door of the black box and therefrom took my old friend, the glass; it presented a most beautiful white and frost-like appearance, and was quite changed in its nature. From a bottle labelled "Developer," the operator poured a solution over the plate, and it immediately grew darker; presently faint lines could be discovered; now the plaid in a little dress, and immediately little hands and feet and faces, and, as if coming up from a mist, three beautiful children appeared seated close beside each other. The developer which produced such a rapid and magical change was composed of

Water	12 ounces
Protosulphate of iron	300 grains
Acetic acid, No. 8	4 ounces.

After pouring it on the negative, as it was called, it was well washed with water, and then the men held it up to the light, put their heads together, rubbed their hands over the back of it, looked through it, and finally concluded that it was hardly strong enough, and that they would have to redevelop it. So they took two bottles down from a shelf labelled "Stock bottle No. I," containing

Pyrogallic acid	24 grs.
Water	12 oz.
Acetic acid No. 8	4 „

and "Stock bottle No. 2," containing

Water	12 oz.
Nitrate of silver	180 grs.
Citric acid	24 „

From No. 1, they took half an ounce, and from No. 2, half a drachm, mixed the two together, and poured the mixture, which they called re-developer, over the negative, moving it from side to side until they said sufficient intensity was obtained. Then the poor negative was put through another washing. I hoped they would get the poor thing *fixed* presently, when sure enough down came another bottle nicely labelled "Fixing Solution—water, 48 oz.; hyposulphate of soda, 24 oz."—which was poured over the negative, after which it was again washed, thoroughly dried, and *another* bottle, labelled "Varnish," taken down, part of its contents poured over the negative, when it was placed in a drying rack, and I saw the men prepare to repeat the experiment on another glass plate. At this moment I felt quite relieved within myself, caused by seeing, as I supposed, that poor glass permitted a little rest; but such, alas! was not the case. Great excitement seemed to pervade overhead, and I saw my kindred sheets dragged away from me, while I was seized by my unfortunate corner, and hurried up a flight or two of stairs into a very warm dark room, and laid down upon a table, where sat a pearly white pan, full of a very pretty colourless fluid, which was called "Silvering Solution," and which was made of nitrate of silver 600 grains, dissolved in water 12 ounces. Of this one-fifth was precipitated, re-dissolved with liq. ammonia, mixed with the other four-fifths, and the sediment dissolved with C. P. nitric acid. Presently I was taken up gently, and carefully floated upon the surface of this beautiful solution for about a minute, which was more pleasant to bear, but more alarming in its results than that offensive albumen. I was then removed and hung lengthwise upon two terribly sharp needles, until the waste solution had dripped from my almost strangled self; I was then placed in a fearfully close box held tightly by two unyielding clips over dozens of tiny gas jets, that winked wickedly at and tried in vain to reach me with their fiery tongues, while I curled myself up to escape their torment and persecution. When dried perfectly, I was removed and hurried through another dark mysterious passage, placed in a box, seized by another twain of voracious clips, and there allowed to hang for five or ten minutes over a saucer of ammonia, which would have been a relief to my nervous system, had it not been so strong as to suffocate me, and deprive me of my senses, to such an extent that I knew nothing until I found myself out in fresh air and sunlight, pressed closely to, and face to face with my old friend, the negative of the trio of tiny children. A coarse, ugly man would occasionally separate us in part, and then quickly press us together again. Finally, we were parted entirely, and purple and black with rage and heat, I was thrown into a dark drawer only to be taken away in a few minutes by a man with very black fingers. He carried me down stairs again, and plunged me into a deep tank of water, vowing he would wash away some of my ugly self, and then fix me so I would not get away soon. After coming out of this generous bath, I observed the image of the three children upon my surface precisely like that upon the negative, which I must leave you to account for. After this, I was put through what the black-fingered gentleman called a toning solution or bath, of water, 1 gallon; acetate of soda, ½ ounce; nitrate of uranium, 15 grains; chloride of gold, 1½ grains to a sheet, the gold and uranium neutralized with bicarbonate of soda, then washed again and *fixed* in the same manner as the poor negative was fixed, and finally placed in a large tank of clean water, where a hundred jets tried their best to squirt me out of existence. I succeeded in floating up in a corner of the tank, and in clinging fast to its side, a trick which I now regret, as I am rapidly fading away in consequence, as they say I was not washed enough, and must soon expect to fade away entirely. I was removed from the tank, and, with a number of other victims, run through a patent clothes-wringer, carried down stairs, my sides and ends neatly trimmed, a smattering of flourine brushed over my back, placed upon a pure white mount or card by delicate female fingers, and laid aside until nearly dry, when I was put through a crushing pair of rollers, a polish of white wax and turpentine rubbed over me, and finally laid aside and pronounced finished. Need I tell you more? How I was placed in the breast pocket of one of our noble heroes, as he left his darling trio and their precious mother to go defend his flag and their homes from the invader? How he kissed me, and pressed me to his bosom before and after battle, and how the hot tears often fell upon me? How the relentless bullet came along, whispering death and destruction, and, sparing me, entered his noble breast, and felled him to the earth? How his eager hands grasped me, and held me before his eyes until they lost their brightness, and until his last prayer for them was sent to heaven? Need I tell you all this? Nay! the story is an old and never-to-be-forgotten one. Your first issue told the tale; I need not repeat it, but simply add that I am fading away, the result of no bad manipulation, for I was made by the best processes known, but of my refusing to be properly washed, which causes the fading away prematurely of many a person, as well as many a carte de visite.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, November 29th, 1865.

On Monday, M. Martens presented to the Academy of Sciences several pictures obtained with the panoramic camera which he invented in 1847, and which I spoke of in one of my recent letters. These pictures, representing various fragments of the panorama of Paris from the quays, the Louvre, and the Place de la Carrousel, were much admired. They are remarkable for their great distinctness, and for the correctness of the horizontal and vertical lines. Lastly, the facility afforded by the mechanism of the apparatus for prolonging and diminishing the exposure, according to the degree of light enjoyed by the various portions of the panorama, gives to these pictures a harmony of the most happy effect.

Numa Blanc, the photographic miniaturist, who has long held a place in the foremost rank of our portraitists, is also one of those who have most perseveringly studied the question of amplifications from a practical point of view. After trying in succession the different apparatus and processes employed in this important branch of photography, he has, in consequence of the irregularity of sunlight, definitely adopted the electric lamp. This enables him to print without interruption, and to turn both day and night to profitable account. A few days back I visited his operating rooms, and was struck, not only with their excellent arrangement, but also with the excellent results produced in them. The lamp is on Serrin's system, and is regulated by the watchwork movement which Duboscq adapts to his instruments. The two charcoal points have been modified so as to allow no intermittence in the production of the light. From the morning till a late hour in the evening, the apparatus works without interruption; for the clever artist takes charge of the amplified printing of the *clichés* sent to him by other photographers. The pictures are taken on paper prepared with iodide of silver, and are developed with gallic acid. In spite of the objections that have been brought against this process, the images are quite as distinct and as vigorous as those printed on chlorurretted paper, and they offer the immense advantage of requiring but from two to four minutes' exposure.

At the last meeting of the French Photographic Society, M. Lœwe showed several specimens of a photographic paper that he prepares with a composition of which he keeps the secret, and which is intended as a substitute for albumen. I took a few sheets, and used them for the printing of several *clichés* with the Dubroni apparatus. The paper is of a very good quality, perfectly white, and very smooth. It may be employed in the ordinary printing process, and gives very pure and brilliant images, approaching those printed upon enamel paper. With my next letter I will send you some specimens. Ernest Lacan.

[FROM ANOTHER CORRESPONDENT.]

Paris, November 29th, 1865.

In a letter addressed to the Paris Photographic Society, M. Gaumé has the following remarks upon the tannin process:—"After many almost fruitless experiments, I have returned to putting the gelatine on the plate before the collodion; but after drying it, I put it into a bath of gallic acid, of 5 per 100 of alcohol, where I leave it for three or four minutes to tan the gelatine; then I wash it in two or three waters, and leave it to dry. The plates thus prepared will keep for years before being used, and collodioned when required, as upon a clean plate the adherence is very remarkable. These plates, with Brebisson's process, are very sensitive; and I never have blisters on them. I develop with gallic acid and acetate of lead, and intensify with pyrogallic acid and silver. After the tannin I wash, and pour the gum and the jujube solution twice upon the plate—first at one end, and then at the other, and leave it to dry. With these plates I can take instantaneous pictures with a simple objective of six inches focus."

M. Chevreul has analyzed the principles upon which the obtaining photographic *blacks* are based, in connection with M. Niepce de St. Victor's note on that subject.

M. Niepce de St. Victor states that it is his conviction that the obtaining blacks in heliochromy is much more extraordinary than the obtaining of colours. He says that "blacks may be obtained by four processes. The *first* is the most interesting, because it admits of the obtain-ng pure blacks, either in the camera, or by contact; these results are obtained by causing a very alkaline liquid to react upon chloride of silver. The *second* consists in developing a weak black, which I call *black by the reduction of chloride of silver.* The *third* consists in submitting a very faint black to the influence of diffused light; I call the result *black by alteration in the lighted chloride.* Lastly, the *fourth* process permits the obtaining a dark tint approaching to black, by making the supplementary colours act successively upon the sensitive coating; for example, blue and orange, which give a grey black tint; it is almost the same with green and red; as for yellow and violet, they produce only a light grey. It is stated above, that to produce pure blacks, we must cause a very alkaline liquid to act upon chloride of silver; but we must not pass beyond certain limits, for in such case, we at last obtain only whites and blacks, without colours, which throws it back into the domain of ordinary photography, with this difference, that we obtain a direct or positive picture instead of an inverse or negative one."

Upon this M. Chevreul remarks:—"I was desirous of knowing if *blacks* could be produced by the radiations of complementary colours falling successively upon the same sensitive surface.

"The result of experiment has been conformable to the principle of the mixture of colours, which is so generally applied at the present day.

"Certainly, the *fact* of the production of blacks in photography, as observed by M. Niepce de St. Victor, is remarkable. How ought science to regard it? I confess that I have no settled opinion, except upon the method of research that must be undertaken, in order to remove every cause of effects which may be foreign to those of the phenomenon observed by M. Niepce de St. Victor.

"For example, I should seek the effects of each of the radiations of the solar spectrum,—red, yellow, and blue; then those of orange, green, and violet.

"I should seek to learn if there exist differences between the oranges, greens, and violets produced by these latter radiations, and the oranges, greens, and violets produced by the red and yellow, yellow and blue, and blue and red radiations of the spectrum.

"If this latter research gave me orange, green, and violet, as may be obtained by the mixture of red, yellow, and blue radiations, I should seek further if the material blacks of nature or of art do not result from the reflection of the rays of the complementary colours, which, instead of acting like white light upon the retina, act in the same manner as the blending of the complementary luminous radiations of the spectrum produces black, brown, or grey upon the sensitive material in photography, as the mixture of coloured materials of complementary colours in dyeing, printing, etc.

"In the present state of our knowledge, I carefully avoid attempting to explain why *material colours* give black and grey by their mixture, and not white. However, I have observed in very numerous experiments upon the re-uniting the radiations of complementary colours separated by polarization, that the mixture corresponds, not to a white light of a brilliancy comparable to the intensity of the coloured lights, but to a weakened white light—that is to say, in translating these effects in coloured materials, they are more white than black."

PHOTOGRAPHING FOLIAGE.

Sir,—Two articles have recently appeared in the Photographic News, on the probable advantage of employing coloured glass in photographing foliage.

It may, perhaps, have escaped the notice of some of your readers, that a similar suggestion was made in the *Times* newspaper, April 12, 1865, by the author of a criticism on a recent series of reproductions, taken from Turner's drawings.

With a view to assisting the photographer in the field, "where strong contrasts of warm brown and deep violet occur, and, generally, in any case involving the combination of grass or foliage with blue sky," the critic remarks:—"If you insert in the diaphragm-plate of the lens of a camera a piece of the greenish-yellow glass known in the trade as cathedral-glass, and look through this at a painting, you do not see much change, beyond a certain lowering of the blues and reds, but nearly the whole of the invisible rays are, in fact, cut off, and by inserting in the diaphragm such a piece of glass, ground flat and parallel, much better photographs of pictures and drawings can be obtained, as well as more pleasing photographs of landscapes, under the conditions of colour mentioned above. Of course, longer exposure would be required; but that is of no practical consequence in this kind of work. Such a glass would be found especially useful in photographing after Turner."

I may add that, on consulting a very eminent London optician on the value of this suggestion, I was told that, theoretically, it promised little advantage. Such a glass would, no doubt, retard the action of the actinic rays, but it would also do the same for the visual rays; its advantage was therefore more apparent than real.

As this subject must undergo further examination, perhaps this contribution to it may not be wholly without use.—I am, sir, yours faithfully, J. Stothert.

Bruges, Belgium, Nov. 26, 1865.

[We remember the article in the *Times*, to which our correspondent refers, and also that it was commented on by a contemporary as equivalent to the Irishman's mode of lengthening a rope, by cutting a piece off one end and joining it on to the other. The suggestion has, however, been made several times by able men; but has not, that we are aware of, ever been absolutely tested. Theoretically, there is certainly nothing absurd about it, and the argument for its use is very simple; thus, the light reflected from dark green leaves cannot become more non-actinic on passing through light green glass: the light would still be green, and, possibly, slightly reduced in intensity; but the light reflected from the sky or other surfaces, reflecting actinic light, whilst equally reduced in intensity, would also be reduced in actinism by the stoppage of a large proportion of the blue rays. The chief difficulty would be lengthened exposure, but the suggestion is well worth a fair trial, especially in reproducing paintings abounding with actinic contrasts.—Ed.]

GELATINO IRON DEVELOPER.

Sir,—Although the subject of gelatine mixed with the developing solution is just now exciting considerable interest, it appears to me that very little is known concerning the chemical changes that occur when gelatine is submitted to the action of sulphuric acid. I therefore venture to add my mite to the general fund, by offering the information I possess.

Mr. Cooper, for want of some more significant term to apply, has named the gelatine and sulphuric acid mixture "sulpho-gelatine," which we shall endeavour to show is a misnomer, as no particle of sulphur remains in the salt formed by the decomposing action of the acid.

Gelatine, when acted on by sulphuric acid, yields gelatine sugar or glycocoll, which is described in Turner's Chemistry (no mean authority by the way) as a substance possessing the usual characteristics of ordinary sugars, so far as sweetness of taste and solubility are concerned; but, unlike most most sugars, it possesses a remarkable tendency to unite with nearly every form of chemical compound, bases, neutral salts or acids.

In symbols the salt is thus stated:—

$$C_4 \, NH_4 \, O_3, \, HO.$$

I am inclined to think that when the gelatine is mixed with acetic acid no chemical change ensues. Experiments should therefore be entered upon to decide from what direction the advantages are derived, whether from the mechanical admixture, or from the production of a double salt, such as the salt of iron and glycocoll unquestionably form. The correctness of those views first entertained by M. Carey Lea, my remarks go far to establish, but his *modus operandi* is unnecessarily complicated, the directions given by Mr. Cherrill being by far the simplest and best. Your honey-process probably assumes a similar combination with the iron salts, as grape-sugar is a substance that combines readily with salts and bases. W. T. Bovey.

Willesden, Nov. 22, 1865.

BLISTERS IN ALBUMENISED PAPER.

Sir,—I thank you for bringing my former letter to the notice of the "Photographer's Assistant." His remedies, however, do not suit my case. The warm bath I always use before toning, and have not found it tend to lessen the blisters.

With regard to his suggestion of a weak, followed by a strong hypo bath, the remedy is, I think, worse than the disease; as the extra bath would take so much time and trouble, which to a professional photographer is so much extra cost in producing his photographs. I am sorry I cannot send you a piece of the paper, but I have given up using it, and cannot find a piece left. Since the cold weather has set in, I have, as usual, had no trouble with blistering, even with the same papers which were very bad in the summer.

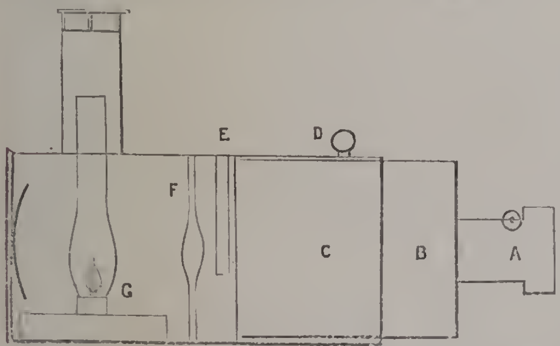
All your correspondents seem to base their remarks on the assumption that blistering takes place in the hypo bath. I have never found this to be the case. The blisters always appear on contact with water, when the prints are taken out of the hypo.

Again thanking you for bringing forward this subject, I remain, sir, yours very truly, Quarto.

[See the suggestion of R. Smith, Jun., in our last.—Ed.]

MAGIC LANTERN WITH PORTRAIT LENS.

Sir,—I am receiving applications from photographers for further information respecting the use of photographic lenses in the construction of a magic lantern. If you should think it worth insertion, perhaps you would print a sketch of mine, with the following description in explanation:—



A is the lens (half size). B, the inner part of lantern for obtaining different size pictures. D, clamp for fastening the same. E, slit for passing the slides. F, condensing lens. G, a passage lamp with $1\frac{1}{8}$ inch flat wick, burning cazaline oil, which gives a magnificent light.

The distance of the lens from the slide is greater than the focus of the lens, but the amount depends upon the size you wish your image to be, and is regulated by sliding B in or out, the focus, when all is ready, being more accurately obtained by the rack of the lens. The distance of the lamp from the condenser F is equal to the focal length of the latter. It is best obtained by sliding the lamp backwards and forwards until a nice illuminated circle of light is seen on the screen, without any dark patches or light ones.

My experimental lantern is made of wood, except the top part over the lamp, which is of tinned plate, as also is the chimney. This top is first put on loosely and bent over the sides, and when the proper distance of the lamp is ascertained it can be fastened. The back of the lantern is hinged, and carries the reflector. It must also have holes to supply air; and the lamp should no more smoke with the back closed than when open.—I remain your obedient servant, T. S. Reeves.

Plymouth, Nov. 21*st*, 1865.

Photographic Notes and Queries.

Colouring Transparencies with Aniline Colouring.

Sir,—I have tried colouring photographs for the lantern with Judson's dyes, and have succeeded well on Ferrier's albumen pictures, but cannot manage collodion transparencies even when coated with albumen, as recommended by a "Mere Phantom," in an extract made by you in your Journal a week ago. I find that the dye does not adhere; and not merely so, the albumen works up with the brush, leaving the glass bare. Can a "Mere Phantom" or any of your correspondents inform me how this is to be remedied?—Yours truly, Educator.

Nov. 22, 1865.

[If the albumen were rendered insoluble by steaming, or by the application of a metallic salt, such as photo-sulphate of iron or chloride of mercury, it is probable that your difficulty would be removed.—Ed.]

Talk in the Studio.

The Porcelain Surface Paper.—A few weeks ago we gave publicity to a description, with which we had been favoured by Messrs. E. and H. T. Anthony, of New York, of a new preparation of paper for photographic purposes, which promised many advantages. A day or two ago we had the pleasure of a call from Mr. E. Anthony, the senior partner in the firm, who has recently arrived in this country. Mr. Anthony showed us samples of the paper, and also of photographs, plain and coloured, produced on the new paper. Nothing could be more satisfactory than those we saw. For photographs finished in water-colours, the paper seems most pre-eminently fitted, the colours working with a delicacy, purity, and brilliancy we have rarely seen equalled. A plain paper print and a print on the new paper, from the same negative, were mounted side by side, the latter, in force, warmth of tone, and richness, having much the same superiority which albumen would have yielded, but without any gloss, the surface being quite dead. The paper is, we understand, Saxe photographic paper, which is submitted to a preparation which fills up the pores with insoluble matter, giving a hard, firm texture, and preventing the photograph sinking in or the fibre of the paper working up. *A priori*, it may be assumed that such conditions will be favourable to permanency; on the subject, however, we can judge better when we know the nature of the materials employed, which, as we understand the process is patented, will transpire in due time. Certain it is that the results are fine, and that, for colourists, the surface offers great facility for fine colouring with little trouble. The samples which Mr. Anthony has left with us, and which we shall try and report upon, are hard and fine in texture, pure in colour, and unabsorbent, without repelling moisture. We shall have more to say on the subject shortly.

North London Photographic Association.—At the meeting of this Society, to be held next Wednesday evening, Mr. H. Cooper, jun., will read a paper on "Improvement in Photographic Processes and the Organic Iron Developer." It is to be hoped that members will attend, prepared with the results of their observation and experience with the new developer.

Steinheil's Periscopic Lens.—The continental and scientific press speak in laudatory but indefinite terms, and probably exaggerated, of the enormous angle it includes. It consists of two deep meniscus lens, each consisting of a single crown glass, and of course each non-achromatic. These lenses are symmetrical, and are placed with their concave surfaces opposite each other, with a stop midway between, thus in general form resembling the globe lens. If we are correctly informed by a scientific friend on the Continent, the largest aperture is one-sixtieth of the focal length. The lens being non-achromatic, an excessively small stop is the only means of reducing the chromatic aberration to a minimum. If this be the case, it is rather a retrograde step in optics, and is practically going back to the old idea of a pinhole stop. The exterior of the Crystal Palace, at Munich, which has been mentioned as including so wide an angle, is stated to have been taken with an aperture of one-sixtieth of the focus of the lens. The exposure must in such a case be enormous, whilst the definition must be impaired by the diffraction induced by the use of very small apertures. We shall look with interest, however, for more definite information.

New Electric Light.—We understand that Mr. Wild, of Manchester, has recently patented a new electric light, obtained by means of steam or other power, working a magneto-electric machine. The intensity is so great that a newspaper may be read by the light at four miles distant. This promises to be valuable in photographic printing, and can be supplied on an economical scale.

◆

To Correspondents.

An Outsider.—Mr. Fry's remarks on enlarging are of course written for photographers who are supposed to be already familiar with the formulæ and manipulations. If, however, you will mention in specific order the further details you wish, we will submit them to Mr. Fry, who will have pleasure in supplying the information. The operation of coating large plates with collodion is not formidable, but it of course requires skill in manipulating, and the use of a suitable collodion; a fluid alcoholic collodion will answer the purpose best.

St. Dennis.—The best is undoubtedly No. 5; the remainder, perhaps, pretty much equal, as you may judge by their published works; No. 1, perhaps, of these having the preference. No 7 is, we believe, the cheapest.

R. W.—Three grains of chloride of gold, two grains of chloride of lime in a pint of water, form a good lime toning bath. In making the acetate bath, thirty grains of acetate of soda are employed with five grains of chloride of gold. You will find full details of various toning baths in our last Year-Book, and also in our next, to be published at the end of the month.

L. M. P.—Thanks; the matter shall have attention. The prints are charming.

C. Subscriber.—The patent albumenized paper, sold by Mr. Lampray, is paper prepared with a solution of india-rubber previous to albumenizing, the object being to keep the image more perfectly on the surface.

E. Hunter.—The preparation of the paper, development, &c., for producing enlargements with the lime light are the same as with sunlight. You will find details in our last Year Book; the matter would require too much space to repeat here. 2. The enlargements by Rolloy, fils, are produced by direct sun printing with the solar camera, not by development. This cannot be effected by artificial light, as the exposure would be too long, and the cost too great.

J. Berrenger.—We have seen the various notices of the periscopic lens, by Steinheil; one of the earliest announcements appeared in our columns, some time ago, in the letter of Dr. Vogel. We look with interest for some more definite information; at present, we fear that the accounts of its capabilities are exaggerated.

Palette.—To copy an object the same size as the original, proceed as follows:—Extend your camera, so that the ground glass is distant from the lens just double the focus of the lens, and then place the object exactly the same distance in front of the lens. Thus, if your lens have an equivalent focus of six inches, extend the camera twelve inches, and place the picture twelve inches in front of the lens; you will then get an image on the ground glass the same size as the original. You will find more detailed information on this subject in the article on Enlarging in our Year-Book. 2. Toning and fixing can, with advantage, be done at night, by gaslight, but a little judgment as to tone must be used, as tones appear slightly different by artificial light. 3. Probably Mr. Blanchard, 12, Camden Cottages, London, N.W., would take such a negative.

E. S. H.—Probably Canada balsam would answer the purpose, used in the same manner as it is used for cementing lenses. A small portion should be heated, and the crystal placed in its socket upon it. The application of heat, not exceeding 212°, would be necessary, for a short time, to drive off all volatile matter, after which, when cool, the cement would be hard and quite transparent.

William Ferling.—The print forwarded is certainly sufficiently good to be worth further trial. It appears to have many excellent qualities; we shall be glad to learn further details, and shall have pleasure in seeing the further specimens.

Ignoramus.—We had not noticed the discrepancy before; but we are disposed to regard the formula as given in the Photographic News of Aug. 18th as correct. In that formula, 24 grains of protosulphate of iron to an ounce of water are given; in the formula read at the Society in November only 12 grains of iron to the ounce are given, which, with the presence of gelatine, and especially in winter, would give a weak developer. Samples of gelatine vary so much that a little judgment must be used in adding proportions. When the solution is too thick with a published formula, use less of the gelatine. We do not, as a rule, think it important to use distilled water for developing solutions, unless the common water contain excess of chlorides or carbonates, such as are common in some parts of the country.

East Lynne.—The method we used to employ to clean wash leather for employment on buffs in the Daguerreotype process is most efficient. First, wash in common water, adding a little common soda; then rinse in clean water; and finally rinse in alcohol (methylated spirit will do), or in a mixture of equal parts of water and spirit. Wring out well and dry, shaking the skin now and then. If rinsed in water only, it may be kept from getting hard by shaking frequently during drying, and rubbing together; but if rinsed in spirit, it will require less attention.

J. Smith.—A description of the apparatus required for using the lime light would require too much space to be given here. It has been described several times in our back volumes, and you will find it in the little work on the magic lantern which we recently reviewed. 2. We do not know what is meant by the "powder of marine plants."

West.—The film splitting from the glass in drying may proceed from many causes, but chiefly from the use of dirty or damp glasses. When there is any tendency to this defect, it is increased by under-exposure and long development or intensifying. Pouring a dilute solution of albumen or gum arabic over the film before it dries will generally prevent the disaster. You will find several articles on this subject in our pages during the last few months. We cannot tell you the prices charged for printing, under the circumstances you name.

B. W. Hawkes.—The addition of bichromate of potash to gelatino-chloride of silver would form a chromate of silver in the preparation. Possibly the shadows might be made insoluble, but the gelatine on the lights and half-tones would be washed away. There are other modes, possibly, of rendering gelatine insoluble. It is possible that the use of a salt of mercury for the chloride would answer if the result would be worth the trouble. If a large excess of free nitrate of silver be added, and then ordinary albumenized paper used for printing, pictures may be easily obtained, but they are really albumenized prints. Thanks, nevertheless, for your note.

Lux et Solus.—Thanks. We will take early opportunity of trying the formula. We shall be glad to receive the further particulars.

Interior.—Applications regarding registration should be addressed to the publisher, otherwise delay occurs. You have doubtless by this time received an answer by post.

A Subscriber.—The presence of any foreign body in the silver solution will prevent an examination of its strength by specific gravity. The only means of estimating the strength under such circumstances, is by taking a small portion and precipitating by a standard solution of chloride or iodide. 2. Frequent filtration of your silver solution is neither necessary nor desirable, unless you have some definite turbidity to remove. 3. By hot pressure you can obtain a higher surface than by cold pressure. 4. It is not absolutely necessary to wash a collodio-chloride picture on opal glass before toning, but it is perhaps as well to do so. You may treat it generally as an albumenized print, remembering, however, that a weaker toning bath is required and a weaker fixing bath, and only a few minutes, washing under a tap instead of long soaking. 5. It is difficult to describe a proper colour for a background beyond calling it grey. Those you mention are, so far as we know, good. 6. There are, we believe, of the two last Year Books a few in print, but for most years they are out of print.

A Poor Amateur.—There are two kinds of doublet issued by Mr. Ross, one to include a wide angle, and one for ordinary angles. Such a description would sufficiently distinguish them.

Studio.—It is a simple Rule of Three sum: as the size of the image is to the size of the object, so is the focus of the lens to the distance between the lens and the object. Thus, if your image is to be 3 inches high, the sitter 6 feet high (about the proportion for a man of 6 feet), and the equivalent focus of your lens 6 inches; as 3 inches are to 72 inches, so are 6 inches to 144 inches: the distance of the sitter must be, therefore, 12 feet. The size of the lens is not an element in the calculation.

Adam Distin.—The specimens have duly arrived, and shall have our attention.

John Taylor.—We forwarded the letter.

John G. Hyde.—You will find a description in Volume I. pp. 79 and 90, and another in Volume VI. p. 208. As Mr. Barrett is a near neighbour of yours (his office is in Mark-lane, Messrs. Barrett and Clay), possibly you might get a sight of the camera.

P. L. D.—See an article on the subject in the present number. To the solution which you find too thick and gelatinous, add an equal bulk, or less or more as may be required, of an ordinary iron developer without gelatine. We do not like the term "ferro-gelatine developer," because it is a misnomer. It is not a gelatine developer modified by iron, but an iron developer modified by gelatine.

W. Bassano.—You cannot do better than follow accurately the instructions of Mr. Madd. We have used with success the collodion of the second maker you name. The collodion best for the purpose should be somewhat thin, powdery, and adherent, and a few drops of acetic acid in the fixing bath tends to retard blistering. 2. Possibly; but we cannot with certainty say, as we have not tried it, to both questions. 3. Any resin or spirit varnish would be dissolved by the collodion. Where gelatine or albumen is used in the preservative, the film rarely has any tendency to leave the glass, as these permeate the collodion film and make it adhere. In Mr. Ackland's recently published modification, there is no tendency in the film to leave the glass. Try it. 4. The chief cause of the solution being repelled in the way you describe is due to the horny character of the collodion. You may modify it by immersing the plate a little earlier, allowing it to remain longer in the bath, and moving it about frequently, but this is only necessary when the collodion is in fault. The nature of the salts with which the collodion is iodized affects the matter somewhat. But there are many commercial samples of collodion which will permit the plate to be kept half an hour without danger of stains or loss of sensitiveness. Get a small portion of two or three different samples, and try them. In all cases remember that certainty depends more on mastering a process by a little careful experiment than on mere formula. You need not apologize for asking many questions. So long as they are stated clearly, we have pleasure in answering.

A Chip again refers to the question of a Life Boat Subscription amongst photographers, and thinks that if subscription lists were kept at the establishments of the various dealers, many would contribute. We can only repeat that we should have pleasure in seeing the thing done, and in chronicling its progress; but we have not leisure to initiate or organize anything of the kind ourselves.

W. Getuen.—The case has only just arrived. Having been addressed to Paternoster Row, it was delayed by the carriers. We shall take an early opportunity of trying the samples and reporting.

Edith.—The works on art by Ruskin, Burnet, Twining, Leslie, and others, mentioned by Mr. Blanchard, are numerous and costly. We cannot, from memory, give you a list of their prices. Your bookseller could probably refer to his "Loudon Catalogue," which will contain complete lists under the authors' names. Should you fail we can ascertain for you.

E. Dunmore.—Thanks. The description shall appear when the diagram is engraved.

W. D.—We shall have much pleasure in receiving the narrative in question.

J. W., Gatehouse, and M. Caoe.—Thanks. In our next.

Several communications are compelled to stand over from press of matter.

Several correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 379.—*December* 8, 1865.

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KEEPING PLATES AFTER LEAVING THE BATH—FILMS REPELLING SOLUTIONS.

A trouble which has several times been brought to our attention of late by correspondents, consists in the collodion film having a tendency to repel the bath solution, so that when, with some trouble, a plate possessing an even film of bromo-iodide of silver, with an even flow of nitrate of silver over its surface, is secured on lifting from the bath, it cannot be kept more than two or three minutes without a tendency in the solution to run from the edges of the plate in little irregular rivulets standing in pools and drops on the plate, which, if kept long, show inevitable stains on developing.

One correspondent, an amateur, writes in a state of extreme distress as follows:—

> I have had in using the wet process much trouble with markings caused by the film repelling the nitrate when in the slide. I have tried water in the collodion as you advised me, and all possible intervals between coating and sensitizing, and still, if two minutes pass between the plate leaving the bath and the development, the plate is covered with irregular markings. And upon looking across the plate upon taking it out of the slide, the cause is evident in the repulsion of the bath solution from the edges of the plate towards the centre.
>
> I sat for my portrait in the studio of our first local artist a few days since, who takes eight C. D. V. pictures on one plate, and very frequently half an hour, or, he says, an hour, intervenes between the sensitizing and developing, and yet he has perfectly clean negatives. Now, how to manage this has been my study by day and dream by night ever since. *Can* you tell me? For pity's sake, help me off with this *greasy* incubus, for my wife laments the day when I gave myself up to studying over photographic pleasures and pains by day, and, as she says, muttering about them by night, for I do not like to hear our beautiful art evil spoken of, even by a justly irritated spouse, robbed of her rest by film-slipping, bath-repelling nightmares. By whatever means the above-mentioned gentleman prepared his plates, he did not lose in sensitiveness, and altogether his negatives were splendid.

The case of the correspondent just quoted is an extreme one, but we have had several other complaints of a similar character within the last few months; and, as the character of the collodion is generally a primary cause of this trouble, it has occurred to us that it is possible that the concurrence of several cases of an unusual trouble in a short time might arise from the use of the collodion of some favourite maker, which, at the moment, happened to have this tendency. Apart from individual cases, arising from exceptional causes, it may be worth while to inquire for a moment into the general causes upon which such defects depend; and to glance at the difficulties, in ordinary practice, arising from a repellent film, and also at the best modes of keeping a film moist and free from stains, in cases where, from long exposure, or other causes, an interval of from half-an-hour to an hour must elapse between exciting and developing a plate.

The tendency of the film to repel aqueous solutions causes the nitrate solution, on removing the plate from the bath, to run in greasy-looking streams over the film; or, if on first removing the plate, the solution flow over it evenly, in a few minutes it runs back from the edges of the plate in irregular fringe-like pools, sometimes standing in single drops. If the weather be hot, the bath old, and the development delayed, stains of matt-silver, of an oyster-shell pattern, or sometimes like slug tracks, appear on the application of the developer. In cold weather, or, if the development be not delayed, the developing solution is generally repelled by the same portion of the film by which the nitrate solution was repelled, and stains from this cause follow.

This tendency in the collodion may arise from three causes, or a combination of them. If the pyroxyline be made at a low temperature, and yield, consequently, a gelatinous collodion, the film will be horny and repellent to aqueous solutions. Other conditions, such as the strength and proportion of the acids employed in preparing cotton, also tend to produce the repellent film. On this cause, however, it is unnecessary to enter in detail here, as it is one beyond the control of by far the greater majority of photographers, few of whom make their own collodion; and still fewer their pyroxyline. Another cause of a repellent film, and one which is a little more in the power of the photographer to remedy, arises from the nature and proportions of the solvents employed in making the collodion. If an excess of ether be employed, and especially if it be anhydrous and used also with anhydrous alcohol, the film will have a strong tendency to repel the bath solution, from the simple fact that ether and water do not readily mix, and a texture saturated with the one will repel the other strongly, unless the process of diffusion be aided by constant motion of the plate in the bath. A third cause, also somewhat within the power of the photographer to control, consists in the nature of the iodides and bromides used in preparing the collodion. If the salts of cadmium be employed, they tend further to gelatinize the collodion, and thus render it repellent; whilst, on the other hand, the alkaline iodides render the collodion limpid and permeable. A further condition, which sometimes tends to produce this repulsion, is the use of a new nitrate bath, the solution having no alcohol or ether mixed with it, repelling these bodies in the collodion the more completely.

The conditions, then, which will produce most completely the repulsion of the bath solution and the formation of greasy lines, pools of solution, &c., on the film, are found in a collodion of gelatinous, horny character, made with a pyroxyline obtained at a low temperature and excess of anhydrous ether, iodized with cadmium, and excited in a new bath.

Besides avoiding this combination of causes, so far as it is in their power, photographers have a few other remedies in their hands. The simplest remedies should always be tried first. These are:—1. Immersing the plate in the solution before it is too dry; as, by that means, although there is a larger amount of ether, &c., to get rid of, the film is more permeable. 2. Keeping the plate in motion whilst in the bath, frequently moving it in and out, and taking care not to remove it until the solution flow freely over the surface. 3. The addition of about one drop to each ounce of collodion of distilled water: this is of course only useful when the repulsion arises from the use of too much ether or anhydrous alcohol. 4. The agitation of the collodion with about half a grain to each ounce of carbonate of potash, allowing it to stand for twenty-four hours, and then decanting from the sediment. This will generally make a horny and gelatinous collodion limpid and permeable. It will sometimes also cause it to fog. In such case, a little tincture of iodine should be added, which will generally effect a cure.

Besides the difficulties with defective collodion, to which we have referred, it will sometimes happen that with samples which are working well for general use, difficulty is found in preventing stains where the exposure is long, and the period between exciting and developing protracted. In such cases it may happen that some definite care is required to prevent drying and stains. The simplest plan, and one which will be found to answer in many instances, consists in the use of iodides, which form deliquescent salts in the ordinary decompositions. The nitrate of potash, the nitrate of magnesia, and some other nitrates, are very deliquescent; if, therefore, the collodion be salted with the iodides and bromides of these metals, the nitrates will be formed in the bath and on the film, which, by their presence, will tend to preserve the plate moist, and materially conduce to the keeping properties without interfering with sensitiveness.

In cases of still more protracted exposures, where the aid afforded by the nitrates thus formed is insufficient, the simplest plan will be to use a second silver bath. After exciting in the usual bath, let the plate be immersed in a ten-grain nitrate of silver bath containing a little pure glycerine, or nitrate of magnesia, as originally suggested by Mr. Spiller, into the details of which we have not space to enter here.

THE SOUTH LONDON PHOTOGRAPHIC SOCIETY'S ANNUAL DINNER.

The idea that wherever a number of Englishmen associate to carry out any enterprize, whether of business or pleasure, their object must be celebrated with a dinner, has almost passed into a proverb. The fact is not strange, perhaps, as almost all the races which have peopled England from its earliest history have given prominence to the pleasures of the table. The Romans were epicureans in their love of luxury; the Saxons were huge eaters; the Norsemen possessed no less capacity; and it is alleged that the term "Cockney" is a corruption of a word meaning cook—suggesting that the characteristics of the compound race had culminated in the metropolis, and given its inhabitants a distinctive appellation.

Whether this tendency to prandial feasting in so many meetings of business or pleasure be the result of national and natural impulse, and that Englishmen gravitate to the dinner-table as matter tends to the centre of the universe; or whether it is the result of a deliberate policy, acting on the conviction that men think, work, agree, and give more readily after dining, there is no doubt that the occasional meeting together for festive purposes of men who often meet on more prosaic business, is conducive to kind feeling, good understanding, and mutual regard. Menenius Agrippa tells us that when we have—

> "——not dined,
> The veins unfill'd, the blood is cold, and then
> We pout upon the morning, are unapt
> To give, or to forgive,"—

and adds, that after "wine and feeding we have suppler souls." Certain it is that the annual dinners of the South London Society are amongst the most pleasant occasions of the many pleasant meetings held by that Society during the year, and the kind feeling which always prevails becomes still more cordial.

On Saturday evening last, between thirty and forty of the members and their friends dined together at the Salutation Tavern, Newgate Street, when Mr. Rudkin provided a most admirable bill of fare, the dinner and the appointments generally leaving nothing to be wished. The Rev. F. F. Statham, A.M., F.G.S., president of the society, occupied the chair, and presided in a very admirable manner, Mr. Sebastian Davis occupying the vice-chair. After the loyalty of all present had been duly evinced, the Chairman proposed the toast of the evening, "The South London Photographic Society," and associated with the toast the name of Mr. Howard, the Secretary, who appropriately responded. The toast of "Photography" was associated with the name of Mr. Blanchard, who, in replying, gave an account of "hair-breadth 'scapes" in the pursuit of his art. "Art Photography" was proposed by Mr. Wharton Simpson, and associated with the names of Messrs. Rejlander and Robinson, who each responded admirably. Mr. Russell Manners Gordon responded for the "Amateurs," and Mr. Wall for the "Officers of the Society." "The Press" was associated with the names of Mr. Simpson and Mr. Taylor, who each duly acknowledged on behalf of the photographic press. Mr. How proposed the "Visitors," specially mentioning the names of Mr. England and Mr. Fry, each of whom responded. Mr. Simpson proposed "Photographic Chemistry" and the name of Mr. John Williams, who replied briefly. The Chairman and Vice-Chairman were each proposed, and responded.

A pleasant feature of the evening consisted in some excellent songs and glees, in which Messrs. Blanchard, Martin, Cocking, Fox, and a visitor took part. Mr. Howard sung a comic song, written by himself, on some of the mishaps of the amateur, which elicited roars of laughter.* The whole evening passed pleasantly and well without a single circumstance to mar it. We commend the idea of annual dinners to other societies.

ENLARGING.

BY SAMUEL FRY.

In the Photographic News of the 6th of November, 1863, may be found a paper, read by Mr. John Stuart before the Photographic Society of Glasgow, on a new form of enlarging apparatus. In a word, this may be described as an enlarging solar camera, mounted equatorially, having the condenser pointed directly at the sun's disc. The rays still passed through the negative and objective as usual. The instrument had at the side a tube equivalent to the finder of an astronomical telescope. Through this tube the sun will pass, and when directed full at the sun, will necessarily form a perfect circle on a small table below it. As the whole apparatus is balanced in such a manner as to move in any direction, a boy could easily keep it following the sun's motion, by moving a handle whenever the circle of light through the finder became flattened; thus the picture, being received on albumenized paper, was printed right up to its full strength, and toned and fixed as usual.

We have seen in the study of the editor of this paper very beautiful examples of this method of procedure—the work of Mr. Stuart—sharp and clear as can be imagined, and nearly of the size of life. But it is unnecessary to point out that however beautiful these pictures may be, that as the full sunlight is a fundamental necessity for their production, it is only during a short time of the year that one could with anything like probability of success undertake pictures by this means in this northern climate. Even in the best summer months, at least an hour must be required to obtain an enlargement to life-size; and that must be from a negative taken specially, and of a different character to that used for ordinary printing. We cannot but believe that for general usefulness our own process, by making a transparency, and from that a large negative, is the only one applicable for all weathers.

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* We believe that this song has been printed for private circulation.

† Continued from p. 556.

During this month of November, we have almost daily without difficulty obtained fine life-size enlargements on glass plates, 25 by 20 inches. During cold, damp weather, a lengthened exposure—say ten to fifteen minutes—does no harm to the plate; and the pictures produced are scarcely, if at all, below those produced by Mr. Stuart's or Dr. Monckhoven's instruments in full summer.

About a month since, we were shown by Mr. George Hooper a form of camera for enlarging by the same means as Mr. Stuart's—which latter, however, was contrived earlier. The whole of the mechanical and optical arrangements were as described two years since by Mr. Stuart; but the camera being, we believe, the work of a Paris optician, was made of a more compact portable form, suitable for removing from place to place, as found necessary for obtaining full sunshine; whilst that of Mr. Stuart was built somewhat as an astronomical observatory, and contained two instruments. The main principles were similar.

The latest method of enlargement, and one that has produced marvellously fine results, is the arrangement of Dr. Van Monckhoven, of Ghent. To this gentleman photographers are indebted for some very useful improvements in various branches of the art; and it must be conceded that the pictures exhibited as the work of his patent instrument far excel anything seen by other processes. The Doctor also has, with a wisdom which photographers will justly appreciate, selected for enlargement some of the very finest subjects and most excellent negatives one can conceive. How much depends on this we well know. Even the best photographs, if of bad subjects, ugly or ill-favoured people, fail to produce any recognition of the skill of the artist. Although it is known to photographers that the common saying of sitters and their friends—"How much better they take photographs abroad!"—is not altogether correct, England being beyond doubt the home and head-quarter of the art—yet I think it will be just to allow that they have in France, and other European countries, a very happy knack of putting the most pleasing examples before one. One does not see nearly so many common-looking, mean visages, amongst their photographs exposed as specimens.

The large size—40 to 50 inches—of these pictures, and the wonderfully perfect definition up to the edges, produced a great effect when first exhibited before the Photographic Society of London.

These beautiful pictures are produced by an instrument similar in most respects to the solar camera; but an additional lens has been introduced, the value of which is thought by many to be more than doubtful. Instead of the whole instrument being moved to follow the sun, the reflector only is driven by clockwork to do so, and a continuous light is thus kept up. Mr. Mayall has one in operation in his studio at Brighton, and this is probably one of the very finest spots in all England for the purpose, as the sun shines a very great many more days in the year on the south coast than inland. At Hyères, in the French department at Var, has also been established an atelier for producing enlargements commercially by this camera; and it will be easily understood that such a position would be eminently suited for it. As for the solar, and Mr. Stuart's camera, a special negative is requisite, thin and unintensified, but possessing all those gradations of tone that, if further strengthened, would produce a good printing negative.

In all these processes requiring the direct rays of the sun, whether a reflector be used or not, the amount of heat generated by the condenser is very great; and much care has to be taken to prevent any of the internal woodwork taking fire; or, as sometimes occurs, the breakage of the negative from the intense heat. It has been suggested that some means may be discovered of passing the light through a medium which, whilst retaining the calorific rays, should not interrupt the passage of those possessing actinic power. These conditions are rather difficult to meet, but may possibly be managed. Of course, anything which shall increase the time of exposure is inadmissible; even under the most favourable circumstances but few can be done in a day.

It is obvious that in choosing which method of enlargement shall be adopted, we must be guided in the first place by the negative. If we can take it specially, and we want it to be untouched on albumenized paper, nothing can equal the results by Dr. Monckhoven's arrangements; but it happens very much more frequently that a photographer has occasion to enlarge from a negative in stock, taken for ordinary printing; for this—in fact, for nine cases out of ten—the most suitable and most readily available is by transparency.

I fear the votaries of gallic acid development will think I have altogether forgotten their process; but I assure them I retain a very vivid remembrance of the details of this process. After practising it with negatives of every character, and all the known formula for salting, iodizing, and developing, I came to the conclusion that it was the very worst process known to photography. Its sunken, woolly appearance, nasty colour, and, worse than all, its most provoking uncertainty, place it far behind the requirements of the day. I therefore believe that the most practicable process for general use, and the one giving almost invariably satisfactory enlargements, is that by transparency.

During the progress of these sketchy, erratic papers on enlargements, I have been favoured with valuable communications and suggestions from all parts; also with a great number of inquiries for further information. I have endeavoured to reply as satisfactorily as possible to these epistles, and shall have pleasure, through the pages of this paper, in doing so again, should further occasion arise.

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Jottings for 1865.—No. 8.

BY A PHOTOGRAPHER'S ASSISTANT.

A Knowledge of First Principles Essential—Further Remarks on the Latent Image—Gold and Lime Toning, etc.

Should a future Soyer undertake to write a series of letters on photographic cookery, for the immediate edification of a country cousin, how exceedingly puzzled will "Dear Hortenso" feel as she reads over the strange catalogue of materials that he is requested to operate upon; for in addition to sundry salts, acids, alkalies, and other substances that are categorically considered as things chemical, she will recognize a list of other articles, whose names and properties have been familiarized by long association with domestic consumption. Among such might be enumerated, tea, coffee, sugar, honey, raspberry jam, rice, tapioca, eggs, starch, isinglass, gelatine, gin, beer, porter; and to the above list she will perhaps find added concentrated extract of beef, and compound essence of mutton, "vinegar and oil" holding a place with the substances last-mentioned, to serve as sauce for a dish of *canards*, that we entertain a disinclination to add it to the list.

Leaving Hortense to digest as best she can the dish set before her, we now approach a subject which has too long been regarded as secondary or of no consequence, viz., first principles. Photographers, as a rule, are strangely ignorant of causes as chemically arranged. To such, the list above given is one of intricate confusion; and so strongly does it seem to bear the impress of the wildest empiricism, or the possession of paradoxical virtues, that some at least fancy that each and every substance known must possess some quality that might be useful in the practice of photographic art; hence the wildest speculations are indulged in, and much time and money wasted in vain research after chemical impossibilities. It is for the purpose of preventing such vexatious pursuits we now sound a note of warning. Remember that in every department of photographic art there is no such thing as chance Success is derived from an arrangement of chemical forces that work out a desired end. Failure must be traced to an opposing cause that has turned operations into another channel. Experience will doubtless impart effective aid in such dilemma, but a thorough knowledge of principles that guide throughout would prove a faithful ally; for with such information the point at which the stoppage occurs will be immediately perceived, and proper remedies provided.

Science is a terrible word to the uninitiated, and yet to the earnest student, how useful does his general acquaintance with it become! How speedily does it unravel knotty problems, clear away the mist of confusion, and produce order in the midst of an apparent chaos! We employ the term "apparent" in its most distinct sense, as we hope to show in this and subsequent papers that photographic difficulties are more apparent than real; that in its manifold operations, its thousand and one adjuncts, the principles brought into operation are few and simple; and as it is our sincere desire to meet the subject in its most comprehensive form, we proceed to an interrogation illustrative of what we wish to convey.

Courteous reader, did you ever visit one of those vast hives of human industry which dispense comforts to a world-wide population — where ponderous machinery is employed, with its numberless wheels revolving and uttering discordant sounds? If so, on entering, did not the heaving levers, eccentric motions, busy cogged wheels, and endless travelling belts, excite in your mind a strangely bewildering sensation? The scene before you appeared to be a whirling, thumping, grinding, hideous noise, producing chaos. But presently, as you began to investigate with an intelligent eye, you gradually became aware that apparent chaos was order, and order the result of beautiful design; each wheel, each lever performing its allotted task, and all held in entire subordination by the master mind—Man; and should your investigation proceed further, your wonder reaches its climax when you discover that all the complicated movements before you are derived from an ingenious application of simple natural laws that might be readily understood after a few hours' study of any rudimentary work that treats on mechanical philosophy.

It is thus with science generally, when allowed to appear unobscured by pedantry. More emphatically do we repeat, it is thus with most questions pertaining to photographic art; a little study, a following up the thread supplied by the accomplished chemist, by analogical reasoning; in short, allowing the mind to form at once the laboratory and analytical operator, at all times permitting the brain to operate on reasonable premises, and that which assumed the blackness of perplexity when examined through the darkened glass of ignorance, under such mental discipline as we have advised now receives the light of bright noon day, and an additional advantage is derived from an increase of perceptive power that causes the mind to detect order even in the midst of what to others would seem a dreary objectless chaos.

Bringing these latter remarks to bear on the next subject in hand, we direct renewed attention to a paper by Mr. John Jex Long, that appeared in a recent number of the News, because the accomplished writer of that article has added an important addition to our stock of information respecting the nature of the latent image, and the uprearing of the superstructure by development.

It will be remembered that an interesting argument in support of the chemical theory was provided by the discovery that an exposed sensitive plate was restored to its normal state by a brief immersion in an iodide solution, and this announcement was followed by a further discovery that a substance possessing an affinity for iodine acted as a sensitizer, thus performing the part usually allotted to free silver. What did these two facts prove? Why, that iodide of silver liberated iodine on exposure to light when a body was present to receive it; and that only under such conditions can iodide of silver be considered sensitive. The interesting experiments described by M. Carey Lea proceed a step further, to prove that an invisible image remains, even though the superstructure be swept away; that an image thus removed might be renewed again and again, which proves an entire separation in chemical composition and properties that exist between the foundation and the superstructure, a difference whose nature we attempted to describe in a former paper. Knowledge having reached this stage, needed but one more stride to lead us into the perplexities of development. Mr. Long has taken the leap, and has provided an additional link, which we now proceed to add to our chain of evidence.

The accidental discovery made by the last-named gentleman has shown that an image is dissolved by the action of nitric acid; or, in other words, the silver that forms the superstructure resumes its original condition as a nitrate salt when exposed to the action of nitric acid; and this apparently unimportant fact to our mind goes far to show the changes that occur during the process of development.

A plate sensitized and exposed bears a latent image plus untouched iodide of silver, plus free nitrate. To reduce this last to a lower state, a deoxidizing salt is employed—instance iron in the form of a sulphate. In such union the iron is willing to accept more oxygen if offered; and what substance more ready than nitric acid to accommodate? Nitrate of silver becomes a sub-oxide, which by magnetic influence is coaxed by the reduced iodide, the superstructure is raised, and the developer is swept away by the washing.

We regard the reduced iodide as the force that breaks connection — the developer which separates the acid from the free silver salt; and so long as the first exercises its influence on the last, so long does decomposition continue; *ergo*, the depth and rapidity of reduction would, under such conditions, be governed by length of exposure in the first instance; and in practice such is indeed the case.

Leaving this subject for a season, we now approach the long designed subject of gold and lime toning. Many theories have been offered to explain the manner in which lime is employed during toning operations; but, to our mind, none has touched the subject at issue. We shall, therefore, in support of this statement, proceed to an exposition of our views on the subject. We now prepare an imaginary bath consisting of water, gold plus free acid, and a few drops of chloride of lime. No decomposing action occurs, because all lies in equilibrio. The gold has its full supply of chlorine, so also has the lime. The free acid would fain join the lime, but there is no assistance at hand to draw chlorine away.

Now place a silver print in the solution, and a disturbance at once takes place; chlorine leaves lime to join the free silver. If sufficient free silver is present to take up all the chlorine provided by lime, well; if not, it unites with the chlorine that is leaving the gold, and together they attack and remove the surface of the print; but an application of boiling water to the gold previous to adding to the toning solution destroys to some extent the bleaching tendency of the chlorine supplied from this source, and with a body of prints there is always provided sufficient silver in a free state to afford employment to the lime. Free acid, of course, joins itself to the deserted lime. The separated chlorine unites and forms an insoluble chloride of silver, whilst the gold obeys a superior influence, and adheres to the surface of the print, being allured thither by the attractive force of its companion chlorine, now rendered powerless by hot water.

From this view of the subject we learn that chloride of calcium, sodium, or any other salt of the same class might be substituted for lime; that where lime is employed it should be used in small quantities, for if the supply of lime is in excess of what is absolutely needed to unite with the free silver, excessive bleaching of the print results, as the chlorine that remains free will immediately act upon the surface of the prints.

It is well at all times to rid the prints of the greater part of free nitrate previous to toning, as a loss of gold ensues should such precaution be neglected.

And now, in concluding the present paper, we bid adieu to our "Jottings," promising, that should we be spared, another year will find us labouring in a similar field, and endeavouring to explain the reason why the various salts used in toning produce variable results. We shall also be in a position to offer from time to time such further explanations as our readers might require, as it might sometimes happen that our remarks, though understood by ourselves, are not so well comprehended by our readers. *Au revoir!*

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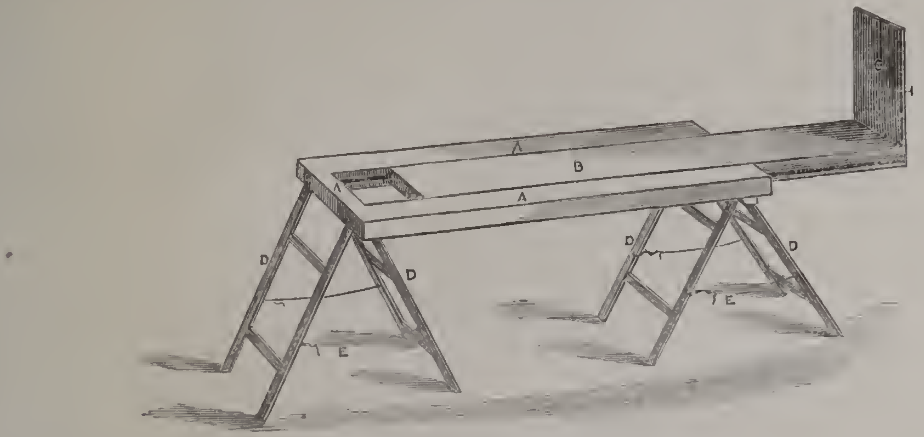
NEW COPYING TABLE.

BY EDWARD DUNMORE.

The trouble and difficulty of copying pictures, &c., by the means usually adopted, so as to avoid reflections, especially from highly-glazed surfaces, induced me to construct a table, as per diagram, and which I have found in practice to be exceedingly convenient, allowing, as it does, the picture to be inclined at any angle, and yet to remain in the proper relation with the camera; avoiding all distortion and saving much time in adjustment—a matter of considerable importance to most photographers. The simplicity of design and small cost of construction will furthermore recommend it to the profession, for most carpenters would make one for fourteen or fifteen shillings. I am not aware that a table of similar design is in use by any excepting myself. If, however, there is, those using them can bear witness to their convenience, and would recommend their general adoption.



EXPLANATION OF DIAGRAM.

A A A, frame of 1½ in. pine, grooved on the inside to allow of the board B to slide backwards and forwards easily.
B, a solid board, 1½ in. thick, sliding backwards and forwards in the frame A A A, for the purpose of lengthening the distance between the camera and picture, to be copied at discretion.
C, a piece of board fixed at right angles to B, to which objects to be copied are attached.
D D D D, legs or supports made to hinge at each end of the frame A A A, for the purpose of altering the picture, &c., to be copied, with respect to the light, to avoid reflections.
E E, string attached to each pair of supports to retain them in the position desired.

[Since the above was in type, Mr. Dunmore has sent us a further modification of the table, but too late for addition to the diagram. It consists of a rising stage for the camera, supported on four uprights which pass through the two sides of the frame A A, and are supported by pegs which pass through the sides of the frame into holes provided at proper intervals in the uprights.]

EXPERIMENTS IN CRYSTALLIZING THE GELATINO-IRON DEVELOPER.

BY J. W. GATEHOUSE.

Since the discovery of the gelatino-iron developer, by M. Carey Lea, I have been trying to obtain this excellen. photographic compound in the form of a crystallizable saltt

I now submit both my results and my *modus operandi* to my fellow-workers in photography, hoping they may be productive of some good result:—240 grains of Nelson's gelatine were treated with 480 grains of concentrated sulphuric acid, diluted with two fluid ounces of water. On the application of heat, the gelatine dissolved with some frothing, forming a solution which held a quantity of insoluble matter in suspension. After fifteen minutes' boiling, it was allowed to cool for some hours, and the clear upper portion then decanted.

The whole of the insoluble matter, having been washed and dried, weighed only ten grains. To the clear brown solution was added 240 grains of clean iron, which was dissolved by a gentle heat till hydrogen ceased to be evolved, the solution meanwhile changing first to a light, and subsequently to a dark-green colour. It was now decanted and filtered, to separate undissolved iron and carbon, and, being diluted with two ounces of water, was placed on the sand bath to evaporate. By these means, crystals of a very light green colour were obtained; which, after being well washed, to separate any free sulphuric acid, were tested as follows:—

The whole of the iron having been precipitated by sulphide of ammonium, the solution was filtered and boiled, to expel the precipitant. Tannic acid now produced in the clear filtrate a well-marked, yellowish-white, gelatinous precipitate, which is very characteristic of gelatine, as protosulphate of iron is precipitated by tannic acid of a dark purple colour.

The sulphide of ammonium apparently carries down some of the gelatine, as the precipitated sulphide of iron is very greasy and gelatinous. The gelatine in this compound may either be in the form of sugar of gelatine or leucin, as these substances are formed from it by the action of sulphuric acid.

Should the results of the comparative experiments with this substance in which I am now engaged answer my expectations, I will lay them before you as soon as I am certain of their value.

Nov. 29th, 1865.

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ON IMPROVEMENT IN PHOTOGRAPHIC PROCESSES AND THE ORGANICO-IRON DEVELOPER.

BY H. COOPER, JUN.*

Much has been said and written on the subject of photographers devoting too much of their attention to processes and formulæ to the detriment of the artistic portion of their labours. That such is the case is doubtless true; but in trying to remedy it, we must be careful that we do not rush to the other extreme—cultivate art, and neglect manipulation. To produce a perfect photographic picture, art and science must go hand in hand with mechanical skill. As has oft been said, there is a proper medium in all things to be found by careful and conscientious seekers. No one can be more anxious than myself to see art more cultivated amongst photographers. One proof of the necessity of art-education is the fact that nearly, if not all, the men whose works we so much admire have devoted their minds to art before the commencement of their photographic career. It is evident that no amount of teaching will make an artist where no natural ability exists; yet, at the same time, natural ability without culture is almost void and useless.

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* Read before the North London Photographic Association, Dec. 6th.

Whilst recognizing the immense and vital importance of the culture of art amongst us, we must bear in mind that instruments and processes are means to an end. And as adjuncts to the production of really artistic works, no one can be more desirous than I am of seeing our formulæ brought to the highest state of perfection.

In every art or science, in order to produce the best result, it is indispensable that the mechanical part be as near perfection as possible. It is an axiom that to produce a perfect whole, each part must be perfect. Let us take an instance from our great teacher, Nature.

The grand and magnificent landscape, that excites the liveliest emotion in those who are capable of appreciating its beauties, is a gigantic perfection made up of minute parts, each one in itself perfection. Every stone, every leaf, all the atoms that compose them, are perfection. But are these parts themselves capable of producing great results? Decidedly not. It is in the arrangement of them that the stupendous effects that we are all more or less acquainted with are produced by nature.

Illustrations can also be taken from the kindred arts of painting and music. One from the latter will suffice for our present purpose. In the art of music it is necessary, in order to give due expression to beautiful, sublime, or lofty thoughts, that the instruments used be good, and that the musician be thoroughly experienced in the mechanical part of his art. In every profession, if the artist has not confidence in the materials used by him to produce a certain effect, the mind is diverted from the principal object. A violin-player cannot so wrap himself in the music he is interpreting as to give his whole mind to a proper translation of the beauties of the composer, if he is in constant trepidation lest at certain passages the strings or bow should give way, and so entirely destroy the effect.

To apply these remarks to photographers more especially, it is only needful to say, that it must be obvious to all that the improvement of the means at our command in all ways conduces greatly to perfection of result.

When the mechanical and manipulatory portions of photography shall be brought to that state that failure in them shall be a thing of exception, and not the rule, then, and only then, can the mind of the photographer be entirely devoted to the proper conception of his picture. How is it possible that a man can give proper attention to artistic value in his productions, and, so to speak, imbue his picture with that spirit and evidence of *soul* in the artist, so vital in a really grand and beautiful work—how can he so express his own ideas that they shall be communicated to the minds of those looking upon his picture, when he is in a constant anxiety with regard to his chemicals, &c.? He does not know but what the effect of the most perfect arrangement may be marred by stains here, spots there, and other vexing and uncertain concomitants of the present state of our processes. Perfection can only be reached by the addition of little improvements; and it behoves us all to do our best and contribute towards the desired end, be it ever so small an advantage. I therefore think no apology needed for bringing again before you the subject of organic bodies in the developer.

That the addition of some form of gelatine to the protosulphate of iron developer has its uses and advantages is evident from the favourable verdict given by many whose names stand high in the profession. On the other hand, that many have found no advantage, or even, in some cases, a positive disadvantage, is extremely probable. This may have occurred either from mismanagement of the new developer, or from their chemicals working so well that a perfect result is obtained without adventitious aid, and without any after doctoring. Gelatine in the developer is a power placed in our hands, which may be used for good or ill. Its use must be governed by discretion, as it is absurd to expect a person to make the best of a power which he does not know how to properly employ.

For some time I had been much troubled with thin grey images, requiring a great amount of forcing in the intensification before they could be made sufficiently dense for printing; thereby injuring the harmony of tone and gradation, and very often being the cause of vexing spots and stains making their unwelcome appearance just at the last moment. A negative, in which the deposit is very minute in its particles, and whose intensity depends more on a non-actinic colour than on depth or quantity of deposit, must necessarily produce a picture more perfect as regards truth and harmony of gradation. The new developer has produced this desirable class of negative for me, as it has done for many others, and as I hope it will do for those who have not yet given it a trial.

Now comes the question as to the best method of preparing it—whether we shall adopt Carey Lea's difficult method, the very simple one of "Clericus," or Mr. Cherrill's. The first I shall discard from the question, on account of the numerous failures it is liable to in production, and because I do not see that it possesses any advantage over the more simple preparation first proposed by Mr. Cherrill. Between that and "Clericus" the choice is very easy, when we come to understand a little their respective properties.

Very tedious experiments have been made to attempt to determine this, as also to see if any improvement could be made in their preparation. Before stating the conclusions that have been arrived at, it may be well to give a brief sketch of a few of the experiments made. Three drachms of gelatine were soaked in water, and when soft, one ounce of pure sulphuric acid was poured upon it. After standing six hours, one ounce of water was added; and after again standing a short time, the solution was poured from the slight deposit present, and mixed with six times its bulk of methylated alcohol. It was now neutralized with ammonia, and it threw down a fine and delicate precipitate; which, after being washed in alcohol, was dried. The three drachms of gelatine and one ounce of sulphuric acid yielded about two ounces.

To form this compound sulphate of glycocine and ammonia, with which many experiments have been made, several methods have been employed; but it does not seem to make any difference whether the gelatine be dissolved in cold concentrated sulphuric acid; the same hot; cold or hot diluted acid; or whether the alcohol be added before neutralizing or after. Five grains of this complex sulphate of glycocine and ammonia added to a plain thirty-grain solution of sulphate of iron gave an excellent developer.

The sulphate is slightly deliquescent, and extremely soluble in water. It may be obtained in a state of greater purity by dissolving in water, and again precipitating by means of alcohol. The crystals are soluble to some extent in hot alcohol, and are deposited in a beautiful way on cooling. By boiling in water, it is partially decomposed, and deposits a small quantity of the yellowish substance already referred to, which is soluble in fresh hot water, but not in cold. Yet, if dissolved in hot water, it is held in solution when it becomes cold.

Two drachms of the sulphate were dissolved in two ounces of distilled water, filtered, and evaporated to one half, at a moderate heat. The clear and colourless liquid was poured off, and the film of tough yellow substance adhering to the pan was dissolved in hot water, and added to it. It was rendered milky, and a flocculant precipitate was gradually formed, which was redissolved upon adding a little water, and the solution became perfectly clear.

This appears to bear some analogy to the milkiness sometimes produced in my last formula, and to the precipitate formed by adding an excess of solution No. 2 in my first formula.

A portable organic developer can be made in several ways. I will mention two. The first is to precipitate the organic salt with alcohol, as just described, and keep it to dissolve in water, as required, with the sulphate of iron.

In the second the iron and organic salt are combined in one, either by crystallizing together a proper proportion of the precipitated salt used in method No. 1 with sulphate of iron; or by dissolving the sulphate of iron in the organic solution, without adding any alcohol. About six ounces of sulphate of iron should be dissolved in the solution containing three drachms of gelatine and one ounce of sulphuric acid. Other salts can of course be added, if any benefit is found from their use.

An experiment, the result of which I did not expect, was thus made:—Two drachms of gelatine were soaked in water, and dissolved in two drachms of sulphuric acid. After standing some time, it was neutralized with ammonia, and eight ounces of water added. This solution was tried in the developer, and such was its restraining power, that two drops in an ounce of a sixty-grain solution of sulphate of iron was sufficient to prevent fog. But the image was feeble and phantom-like; and although the exposure had been a long one, there was a great lack of detail.

This, and other experiments in the same direction, show that we must not add too much gelatine to the sulphuric acid. I have found that three drachms of good strong gelatine to one ounce of concentrated acid is the maximum that can be satisfactorily employed. In some cases it will be as well to use only two or two-and-a-half drachms, as it is better to have too little than too much. The "sulphuro-gelatine" solution has been prepared in a multitude of ways, but none better has been found for general use than the one I last gave. It is not deemed necessary to tire you with the details of them; but should it be needful, they can be described during the discussion. I may here mention, that through the kindness of Mr. Bockett I have been enabled to make a microscopic examination, under polarized light, &c., of the different organic salts prepared for experiment. What I wished to discover some clue to was, whether a definite chemical combination was formed between the sulphates of ammonia and glycocine, and other unknown bodies present; and also, whether the combination was altered in any material degree by variations in the mode of preparation. The subject of organic chemistry, particularly as applied to gelatine, is so hemmed in by doubts and difficulties on every side, that although we have met with some curious and pleasing results, I am sorry to say that we have been unable to arrive at any very definite conclusion on the subject.

A few crystals of salts containing glycocine, etc., which have been used in different trials, I shall hand round for examination by those interested. I may also notice, in passing, that I have attempted to prepare a salt of glycocine in several ways by the action of *alkalies* on gelatine, but have not been very successful.

As this paper is already a good length, I think it now time to say a few words on the two methods of preparing the organic solution; viz., that of "Clericus" and the one proposed by Mr. Cherrill. It appears to me, and I think my opinion will be borne out by those who have carefully worked the new developers, that gelatine simply dissolved in acetic acid and added to a solution of sulphate of iron acts almost entirely in a mechanical way, and is principally beneficial on account of the oily or glutinous properties it communicates to the developer. It also causes the silver that forms the image to be deposited in a slow and even manner, and giving, moreover, a picture free from any tendency to fog. But when we have a salt of glycocine in the developer, the case is very different. The action is chemical in a high degree and very slightly mechanical. It possesses the power of altering the density of the deposited silver and materially changing its colour. In the two formulas given by me an attempt has been made to combine the valuable chemical effects of sulphate of glycocine and the mechanical ones of gelatine.

The nitrate of glycocine also gives great intensity; but the most powerful agent I have yet discovered is produced by dissolving gelatine in nitro-sulphuric acid and neutralizing with ammonia.

I have tried several modifications of the "honey developer," but, although I think it an improvement upon the ordinary, I am not so pleased with it as with either of those containing gelatine.

The addition of a little formic acid to the different organic developers has given me great satisfaction. I can fully endorse Mr. Jabez Hughes' suggestion as to the best mode of deriving the full benefit from the new developer. It is to have ready for use two solutions, one prepared either by Mr. Cherrill's formula or by some modification of it, and the other consisting simply of gelatine dissolved in acetic acid. If only a slight increase of intensity is desired on that already given by the chemicals with which we are working, we may use a little of the aceto-gelatine solution in our developer in the place of plain acetic acid. But if greater intensity is required, or if the image usually given is thin and grey, then we must use a developer containing either sulphate or nitrate of glycocine, or, more properly speaking, gelatine that has been fully acted upon by sulphuric or nitric acid.

I would recommend some chemist to prepare a crystallized sulphate of glycocine and ammonia, or potash, as it is a very convenient and portable form of the "sulphuro-gelatine" solution. The best preparation is that precipitated by alcohol. There is also little doubt of its possessing good keeping qualities if placed in a well corked bottle.

Some of my friends, who have tried the new developer, have complained that a longer exposure was required than when using the ordinary iron solution. This has, I believe, arisen from their having used too large a proportion of the organic solution. In some cases, particularly at this season, only a minute quantity is required.

My concluding recommendation is: prepare ten ounces of a plain solution of sulphate of iron, say thirty grains, and add a few drops of organic solution. Try a plate. If after prolonged development there be any trace of fog, produced by abnormal reduction, add a little more of the organic solution until the right working proportion is found; when I doubt not that benefit will be experienced from the use of gelatine in the developer, and a feeling of thankfulness to Mr. Carey Lea will arise for his valuable addition to our photographic formulæ.

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Recent Patents.

The following specifications of patents referring to photography have recently been published:—

CUTTING PHOTOGRAPHS.

This invention, by Daniel Fruwirth, relates to an improved apparatus by the use of which the edges of photographic impressions, cartes de visite, stereographs, and other similar articles may be cut off, the action being such that all four sides of the card or paper are cut away by one stroke of the cutter.

The apparatus consists of a table plate of metal or other material on which a block or rest of iron or steel is fixed, its dimensions and form corresponding to the size and pattern to which the card or paper is to be reduced; over this block is a four-sided or other shaped cutter or shears, the internal edges of which fit the outer edges of the block; this cutter is held by an arm whose extremity is attached to a hinge or fulcrum on the end of the table furthest from the block; underneath the table plate a flat spring is set by a screw, and the movable end of the spring is connected by a vertical pin (passing through the table) to the arm of the cutter, so as always to exercise a downward powerful pressure or strain upon the same. Near the centre of the table a horizontal cam is set in bearings, and is provided with a handle by which it may be turned by the operator. The surface of this cam is made to assume an oblique or incline during its entire circumference, and at its highest point a vertical ledge descends to its lowest surface; in its revolution it acts upon a vertical pin underneath the arm of the cutter, and raises the same against the action of the spring; the card or paper is then arranged on the block and under the cutter, and the cam being turned slightly further, the pin escapes over the ledge, and the cutter is forced down, thus shearing all sides of the paper or card with clean and even edges.

SUBSTITUTE FOR ALBUMEN.

This patent is for the manufacture of a substitute for albumen, and is a communication from Mr. Charles Kestner, of Thann, France.

The object of this invention is to treat gluten in order to give it the property of albumen obtained from eggs, whereby it may be substituted for albumen in manufactures and otherwise.

This product or substitute for albumen is called by the inventor "mixed albumen," because of the analogy existing between it and albumen obtained from eggs, and because also it is composed of gluten, prepared as hereafter described, mixed with albumen or other soluble bodies, such as gum.

To prepare gluten to be used in the preparation of this mixed albumen, care must be taken to remove the starch as much as possible, as success will depend in a great measure upon its more or less complete removal. For this purpose, and in order to impart to the gluten properties which will allow of its being applied in various manufactures as a substitute for albumen obtained from eggs, I ferment it in tepid or cold water of convenient temperature, say at from 60° to 80° Fahr. I stop the fermentation when the paste of the gluten becomes sticky, and before it dissolves in the water; I then draw off the water. I saturate the fermented gluten with a solution of carbonate of soda until litmus paper will no longer indicate any action, or until the mixture becomes slightly alkaline. I then wash the mixture in cold water, and knead or work the mass to remove all the soluble salts; I then again ferment it as before. I afterwards saturate it, as before stated, with carbonate of soda, after having drawn off the water. I next wash the product in pure water. The glutinous mass separated from soluble salts has a clearer colour; I dissolve it in caustic ammonia, the quantity of which will vary according to the quality of the two substances—generally 3½ ounces (96 grammes) of ammonia will be sufficient for 2¼ pounds (one kilogramme) of gluten; if the water and ammonia were removed by evaporation at a gentle temperature, the gluten would be sufficiently pure, but it would not have the property of redissolving in pure water. To render it soluble it is necessary to add to the ammoniacal mixture, before its dissication, some bodies which dissolve easily. Several substances may be used for this purpose, but it is preferable to use those which do not deprive the product of properties similar to that possessed by white of egg. I prefer pure animal albumen or gum, or a mixture of these two substances. I incorporate these substances in the form of aqueous solution with the ammoniacal mixture of gluten prepared as before described, and I dry the mixture into blocks or otherwise, as is the practice with albumen. The best proportions are about one part of dry soluble substance to two parts of dry gluten; some kinds of gluten require more, and other kinds less soluble substance. The solution obtained is quite uniform, and no part can be separated from the rest. It is run upon tinned plates, and dried at 60° Fahr. at the highest. When the product is well dried it becomes detached from the plate; it possesses a yellow colour, and can be easily redissolved. To redissolve it take equal quantities in weight of the product, and water, and stir well.

The product obtained may be used as a substitute for albumen as employed in manufactures and otherwise, especially for printing stuffs and clarifying liquids for photographic purposes; however the mixture should be made free from gum.

PHOTOGRAPHY AS AN ART.

M. Claudet has recently addressed the following able letter to the *Gazette des Beaux Arts*, in answer to some disparaging remarks on the position and character of photography:—

Monsieur,—In the October number of the *Gazette des Beaux Arts* I read these words:—"*La Photographie, la bête et vile Photographie.*" It is in these strange terms that the author of an article entitled, *De quelques arts qui s'en vont*, introduces the subject.

If, with the object of gratuitously disparaging photography, we were to seek expressions more singularly inappropriate and remarkably false, it would be difficult to find others which could be applied with less justice and reason than those I have quoted.

According to the *Académie*, *bête* signifies *silly*, *stupid;* and *vil* signifies *low*, *abject*, *despicable*. Under which point of view, may I venture to ask, is it right to apply to photography such injurious and disgusting qualifications?

What! One of the most beautiful discoveries of the age, which, amid the applause of all Europe, scientific and artistic, was honoured with a national recompense—a discovery founded upon the combination of the most extraordinary principles of the physical sciences, and producing the most perfect results, and exquisitely charming (in spite of the numerous exceptions which prove the rule)—does not this brilliant discovery deserve, under the pen of a pure and brilliant writer in the *Gazette des Beaux Arts*, some other qualification than *bête* and *vil?* I regret it extremely, because I am one of those who understand photography, admire it, and forsee its future, and who also comprehend the useful influence it must exercise upon the Fine Arts, especially in their connection with manufactures.

But photography has been judged a long time ago: at its birth the illustrious Delaroche, in a note addressed to the no less illustrious Arago, when charged with making a report from the *Académie des Sciences* to the Chamber of Deputies upon the great merit and immense value of the invention of photography. Delaroche's words were,—"The beautiful discovery of Daguerre's is an immense service rendered to the arts."

We cannot fail to recognize that there are *arts which die out*, and that it is photography which has struck them with death. Why are there no miniature painters now? For the very simple reason that those who want miniatures find that photographs are better, and that, instead of portraits more or less incorrect with respect to drawing and character, photography produces perfectly exact likenesses, which at least gladden the heart and satisfy the memory.

Why have we fewer engravings and lithographs? For the reason that photography gives us more perfect representations of all the creations of genius, and in less time and at less expense, than the old methods. The arts which died out were themselves, after all, neither *bête* nor *vil*; and can we apply these terms to the art—*mechanical*, if you please—which replaces them, for the simple reason that its results are better than theirs? What is there then so *stupid* and *vile* in this triumph, easy though it may be?

Printing, also, killed more than one art, and the most to be regretted is calligraphy.

Printing is even more mechanical than photography, yet for all that, who would think of calling it *stupid* and *vile* though, like the machine in its rapid course upon the road of, progress, it overthrows and destroys an excellent art which can never be replaced? Photography has many features of resemblance with printing, and, like its senior, it is called to exercise a great influence upon everything which concerns the arts and sciences, and, like them, to contribute to the development of taste, intelligence, and instruction.

Shall we call the railway a *stupid* and *vile* invention, because it has destroyed the stage coach, which carried us very slowly, it is true, but much more poetically? We traversed mountains and valleys, amid picturesque ruins, with time to admire the most varied scenes. What varied sensations did we not experience while passing the straw-thatched roofs of the hamlet or quiet village, and, at twilight, entering slowly over the drawbridge and through the studded gate of the fortified city, surrounded with ruinous walls and empty moats! Of all this there remains only the remembrance, which does not justify the epithets *stupid* and *vile* being applied to another and more useful order of things.

And the courier—that agile and interesting being who formerly conveyed our hurried messages—should we not be equally justified in applying as coarse an epithet to the metallic wire which has destroyed his occupation, and which in invisible waves through solid matter transmits thought to any distance with the rapidity of lightning?

All that civilization has painfully accomplished; all that the labour of man has with painful effort drawn from the depths of science; in a word, everything which constitutes a triumph of genius, deserves admiration and respect, especially of writers who accept the mission of directing public judgment in all questions of art and progress, and of spreading the knowledge which must form the mind of the present to serve for the future.

Why, then, in our society are we always so ready to disparage everything that is popular, and take so much pleasure in disparaging what the generality admires?

This is one of the defects of our national character that we do not like to encounter among the erudite and refined classes, writers whose mission it is to enlighten, direct, and instruct.

But perhaps I have said too much, when I ought to have confined myself to expressing to you the pain I felt in reading in the present number of the *Gazette des Beaux Arts* the unworthy, disparaging expressions which the author of "The Arts that die out" has felt a right to employ while speaking of photography.

Would that I could efface from my interesting series of the *Gazette des Beaux Arts* those two unhappy words, which will always be present to my eyes!

I hope you will insert this letter in the next Number of the *Gazette des Beaux Arts*. You owe this reparation to the large class of photographers spread through every class of society, even to the highest, who would like to meet in the *Gazette des Beaux Arts* a protector disposed to direct photography in its path among the arts. I hope you will not refuse this reparation—or, rather, that you will prove, as you have already proved, that the spirit of the *Gazette des Beaux Arts* can only be favourable to the interest and progress of photography.

Accept, Monsieur, the assurance of my profoundest respect.

A. Claudet, F.R.S.

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TERCHLORIDE OF GOLD.—HOW TO TEST ITS IMPURITIES.

BY PROF. TOWLER.*

This salt is almost always adulterated; it is sold as a crystalline or dry mass; but pure terchloride of gold will not crystallize and is not dry; at least, it soon deliquesces if exposed for even five minutes to the air.

To ascertain this fact and the amount of the adulteration, proceed as follows:—Dissolve ten grains of the supposed terchloride of gold in an ounce of distilled water, and then pass a current of hydrosulphuric acid through the solution as long as black precipitate is produced. Boil the mixture until all smell of hydrosulphuric acid has disappeared, and separate the precipitated terchloride of gold from the liquid part by filtration. Wash the precipitate with a few drachms of distilled water, and add the washings, when filtered, to the previous filtrate.

The liquid portions are now evaporated to dryness. If there is a sediment, the gold salt was adulterated; the amount of the adulteration may be ascertained by weighing the dry mass; the difference between this weight and the ten grains of gold salt used will be a rough estimate of the pure terchloride of gold present in the salt.

How to Prepare Hydrosulphuric Acid.

For this purpose we require some sulphide of iron (sulphuret of iron). This you can purchase at most of the drug stores, but especially from the analytical chemists. But you may easily prepare it yourself as follows:—

Heat a bar of iron in a blacksmith's forge or a hot coal fire to a white heat nearly or quite, and then rub the part so heated with a stick of sulphur; these two substances will combine with great energy, and the combination will drop from the end of the iron bar like drops of oil. Allow this sulphide of iron to drop upon a clean flag or piece of iron; and, when you have got a sufficient quantity of this substance, heat it so as to drive off or oxidize all the free sulphur, and then break it up and preserve it in a bottle for use.

Next, get a glass tube, bent twice at right angles, like the letter L, and introduce the shorter bend into a perforated cork which fits the neck of a florence flask. Into this flask introduce two drachms of the sulphide of iron, six drachms of pure water, and one drachm of sulphuric acid, and put in the cork furnished with the bent glass tube. The larger arm of the tube is intended to dip into the fluid to be analyzed. Heat is now applied, if required, to the flask, when two decompositions take place; sulphide of iron is decomposed, and so is water; the oxygen of the latter combines with the iron, so as to give rise to oxide of iron, which enters into combination with the sulphuric acid, in order to produce sulphate of the protoxide of iron. Whilst these combinations are taking place in one part, the hydrogen of the decomposed water combines with the sulphur of the decomposed sulphide, and gives rise to a gas, the sulphide of hydrogen, which passes out of the tube.

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* From *Humphrey's Journal.*

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Correspondence.

BLISTERED PRINTS.

Sir,—Having at various times been subject to the annoyance of blistered prints, I have felt deeply interested in the queries of "Quarto," and in the various answers and remedies which his first communication elicited; but I think the subsequent correspondence has only more fully confirmed your own opinion, that we are as yet but imperfectly acquainted with the causes of this very hateful annoyance in our profession.

Some two years ago, when using *Rive* paper very extensively, every batch of prints contained a considerable number which had to be thrown away as quite useless. The albumen film in such cases was so slightly attached to the paper that the least friction or strain would remove it altogether. Several photographic friends were consulted, and many of their suggestions carried out; but with no better results.

A communication addressed to one of the journals elicited the same reply as that given to "Quarto"—viz., discard *Rive* paper altogether, and use only *Saxe*. Acting on this suggestion, an improvement was brought about, but not a total exemption from the "blister plague." But the very yellow tint of most *Saxe* paper two years ago rendered it a very undesirable article for printing vignette, in which our practice was very extensive. Subsequently I wrote to our paper dealer, complaining of blisters, and inviting a remedy. He advised the trial of a totally different system of toning. This suggestion I knew was perfectly useless, as I had cut several prints into four pieces, toning three out of four differently from each other, and fixing the fourth without toning. They all blistered alike, shewing that the cause was not in the system of toning adopted. The majority of the prints in my general practice at that time seldom showed any tendency to blister beyond a slight roughness of the surface when in the hypo, but immediately on placing them in contact with the first washing water, after fixing, a host of small blisters covered the surface of every print, most of them extending until a hundred burst into one, the film being then detached in patches, varying in size from that of a pea to a crown piece. This tendency was always most perceptible after fixing thick *Saxe* in a rather strong solution of hypo. On reducing the strength of fixing bath to 3 oz., hypo to 20 oz, water, the blisters diminished in size and number, but on adding 1 oz. alcohol to 40 oz. fixing solution a blister was never seen.

Since the experiences detailed above, a new source of blisters has presented itself—viz., the quality of water used for washing prints after fixing. If this water is received from the mains at a very high pressure, charged with air and alkaline and other matter, it will completely detach the albumen film from the paper. Some months ago, rain-water in this district was highly charged with saline matter: prints washed in this water before toning were immediately covered with a thin and insoluble veil of chloride, which the toning solution only partially penetrated, leaving the finished print flat, mealy, and dirty in the whites. To avoid these miserable results, I had the water of the F. Waterworks laid on the premises, and finding it of good quality, it was used for every purpose. During the past summer there have been several fractures of the mains, and as I am placed at the extreme limit to which this water is carried, it frequently comes effervescing like soda-water when first drawn. Prints (after fixing) on any albumenized paper, immersed in water in this state, are sure to be instantly covered with blisters. A large number of very perfect prints, free from blisters, were left in running water the other evening, but next morning many of them were found hopelessly detached from the paper, whilst prints and water seemed a mass made up of paper and soap bubbles; on experiment I found that the prints were soonest affected injuriously if immersed face downward.

All of them were on *Saxe* paper of the very best quality. Another batch of the same prints, that stood all night in rain-water, were quite perfect and free from blisters; thereby demonstrating, that while "poor old Hypo" has many sins to answer for, "Aqua pura" is not always free from blame. A remarkable feature in connection with water as the cause of blisters, is the fact that, when it will blister albumen prints, it will also blister a collodion film on glass.

Enclosed is a print from a negative taken the morning after the last-named case of blistering. It was perfectly clear up to the point of washing, after fixing, when it became covered with froth and blisters. It had been fixed with cyanide. A number of these blisters are very perceptible in the background of the print sent. When the water is slightly alkaline, and charged with air, it always produces similar results. By drawing off the water, and allowing it to stand some time before use, the tendency to produce blisters is greatly diminished.

To avoid blisters on my prints, I now always observe the following rules:—

1. Never use any other than *Saxe* paper.
2. Never use fixing bath stronger than 3 oz. hypo to 20 oz. water, adding 1 oz. alcohol to every 40 oz. fixing bath.
3. Never wash prints after fixing in water showing effervescence when drawn from the tap.
4. Let the prints lie face downward when in running water, and let the water enter the washing bath at a point slightly *above* the prints. If the water enters at the bottom, as is the case with some syphon baths, blisters are sure to follow, particularly if the water is frothy, and charged with air.
5. If pipe-water is very effervescent, use rain-water for a dozen washings after fixation.

Apologizing for taking up so much of your space, and hoping that some of our societies will investigate the subject to a successful issue, so as to banish the "blister plague" from the profession—no matter what paper is used—I am yours respectfully, Sixtus.

MIXED ACIDS IN PREPARING SOLUBLE COTTON.

Sir,—For the further information of your correspondent, William G. Grove (if he is the gentleman who inquired about the formula for collodion I gave in your paper), I may send you the following particulars:—

The edition of *Hardwich's Photographic Chemistry*, from which the formula was taken, was published in 1856. The mode of calculation which he employs is so satisfactory, that it may be well to note it, as it is a formula which will meet almost every emergency.

The formula for nitro-sulphuric acid should be—

$$HO\,NO_5 + 2\,(HO, SO_3) + 3\tfrac{1}{2}\,HO.$$

Or,

$$\left.\begin{array}{lclcr} NO_5 & \ldots & 1 & \ldots & \cdot 50 \\ SO_3 & \ldots & 2 & \ldots & \cdot 80 \\ HO & \ldots & 6\tfrac{1}{2} & \ldots & \cdot 58 \end{array}\right\} \text{These are the atomic weights.}$$

$$\overline{.192}$$

Having found the percentage of nitric acid (NO_5) in the sample on hand, by the hydrometer or other means, and also the percentage of sulphuric acid by the same means,

Let

a = percentage of nitric NO_5.
b = " " sulphuric SO_3.

Then,

$$\frac{5400}{a} = \text{quantity of nitric.}$$

$$\frac{8000}{b} = \text{" " sulphuric.}$$

$$192 - \frac{5400}{a} - \frac{8000}{b} = \text{quantity of water.}$$

These are quantities by weight: if thought better to measure them, the following formula must be applied.

Let a = sp. gr. of the acid,
b = weight, in grains found before;

then $$\frac{b}{54{\cdot}7 \times a} = \text{number of fluid drachms.}$$

By way of example, suppose we have

Sulphuric acid ... ... sp. gr. = 1·829.

and

Nitric " ... ... sp. gr. = 1·446.

Required the quantity of each, and also the quantity of water.

The sulphuric acid contains 75·83 per cent. of real acid by hydrometer tables.

The nitric acid contains 65·35.

Formula for the weight of each—

$$SO_3 = \frac{8000}{75{\cdot}83} = \text{about } 105{\cdot}7$$

$$NO_5 = \frac{5400}{65{\cdot}35} = \text{about } 82{\cdot}6$$

$$\overline{188{\cdot}3}$$

$$192 - 188{\cdot}3 = 3{\cdot}7$$

Answer.

Sulphuric acid, about	105·7 grains
Nitric " "	82·6 "
Water...	3·7 "

It will be here seen that I have worked out the simple result for other strengths of acid than those mentioned in the News; the same principle will hold good in all cases.

The hydrometer tables may be found in almost any work on chemistry.—Yours truly, Nelson K. Cherrill.

GELATINE PRINTING BATH.

Sir,—Some time since Mr. Palmer gave to us, through the News, his formula for the gelatine printing bath, which I tried and found too troublesome for use, so I added an ounce or so to the plain nitrate bath, and so used it up. Then came Jotting No. 7, by a "Photographer's Assistant," No. 343, Photographic News, Oct. 27, page 509, and he suggests a much simpler mode, so on Saturday morning, when I got the News, I made up 20 oz. of bath, and put the proportion of gelatine therein stated, viz., ½ oz., being at the rate of 80 ozs. of water to 2 oz. gelatine. Through one thing and another, I did not get the gelatine bath ready until the afternoon, and my printer did not look with any great delight upon a thick, deep red solution. I got two quarter-sheets floated, but they dried badly, having, as you say, thick clots of gelatine; and, on cooling, the bath threw down a quantity of opaque spongy matter. In the evening I looked over Mr. Palmer's communication in April, and there found that I ought only to use ½ oz. gelatine for 80 oz. water, instead of, as I had done, ½ oz. for 20 oz. water; so I took about a quarter of my gelatine bath and made up to 20 oz., and floated a few quarter-sheets every day, but did the most of the printing upon the 45-grain plain nitrate bath, and when mounted I could not see any difference between the prints, and the printer said he had to print very much deeper with the gelatine paper than the other, which, in the dull weather we have had, was a consideration.

Each time, on pouring off the gelatine bath, there was a quantity of thick matter at the bottom of the dish, which was poured into another bottle, and every morning 17 to 20 grains of nitrate of silver, for every whole sheet used, was added to the gelatine bath, the plain bath having water and silver added when it got low. I have tried filtering with paper and linen, and the best and quickest plan is to wet a piece of linen, or fine muslin, place it over the funnel, and pass the gelatine bath through it every morning. The last formula I have seen is Mr. Palmer's, published in the News, Nov. 3, page 524; except that he does not there say how much gelatine for the quantities there mentioned. I find 3 drachms quite enough. The bubbles on the bath, when found out, I get rid of by passing a strip of blotting paper over the surface—one piece has lasted me now three weeks.

And now I come to a later number of the Photographic News, No. 377, Nov. 24. Up to that time I had not added liquor ammonia. I did so last Saturday—1½ drachms to 30 oz. gelatine bath, about 20 to 25 grains of nitrate of silver to the ounce water, and about an hour after the bath became much lighter in colour, and much thinner, and, when poured off, there was not any deposit or thick matter left. Now, I find that the prints do not require any more overprinting than with a plain nitrate of silver bath. I have since prepared a bath—nitrate of potash 60 grains, nitrate of silver 25 grains, and exposed under a carte de visite plate, with three positions—one carte de visite from each bath—and found them all require the same time, and to tone alike in the same bath—acetate of soda—and, when mounted, and rolled, I could not tell the difference. With nitrate of potash I found a slight tendency to become mealy. I have also tried toning with the lime-bath, but the shadows of the gelatine prints go so black that the people here complain. I will try and send you a few prints per next post, but the weather is so dull I can hardly spare them. I have tried fuming the paper from all these baths, but cannot say I find it prints quicker or better. Anyhow, you know how the bath prints, and how the prints look when mounted. I forgot to mention that I used Nelson's gelatine.—Yours truly, M. Cage.

[As we have before said, it is impossible to give a proportion of gelatine of unvarying application, as samples of the material vary so much in quality. It is interesting to have the experience of many persons with any new method of working.—Ed.]

Photographic Notes and Queries.

Exchange of Accessories.

Sir,—What an advantageous thing it would be to many professionals if they could conveniently make an exchange of photographic accessories and materials, as much that would be out of date with one locality would be novel and interesting in another; and it has occurred to me a society may be formed somewhat upon the following conditions:—

A committee of gentlemen in London to undertake the general direction.

Subscribers, professional or otherwise, to be allowed to forward goods and materials of every description required for the art, or the successful working in the studios, for sale, *properly packed*, with a price, including such packing-case, &c. (carriage paid).

The goods to be on sale for three or four days, and if not disposed of, returned to the owners, properly repacked by servants appointed.

Two or three salesmen may be appointed to carry on the business department, and during the three or four days, meetings may be held, at which different papers may be read.

But (you will say) what about funds?

Let each subscribe or guarantee 1*l.*; and say 500 did so, the whole expense of exhibition room, printing catalogues, &c., may be met; at the same time photographers may themselves be brought even to a focus, and meet their friends once in the year during the dull period, thus preparing for the really business season. There may also be an Exhibition of Photographs.

The whole may be accomplished in a week or ten days, and there would be a mutual benefit to all.

I leave the idea with you thus roughly sketched, and remain yours truly, Ignoramus.

[We fear that there would be great difficulties in the way of working out such a project, but we give publicity to the suggestion.—Ed.]

Pinholes in Bath.

Sir,—A few days ago, I made a new nitrate bath as follows:—I took a spoonful old bath and one crystal iodide of potassium, washed well, and added the silver and water to the proper quantity. Twice a plate was foggy; I added nitric acid till the blacks were clear, but every plate was covered with a sandy deposit (pinholes forerunner), thousands on a plate. I sunned the bath after adding carbonate of soda, but with no better result; then added cyanide, no better still. I have made bath in the same way for ten years, and never saw anything like it before in a new bath. If the Editor can explain, I shall feel it a great favour and an instruction.—I am truly yours,

John Gilling.

[It is probable that you overiodized your bath to begin with. A "crystal" of iodide of potassium is too indefinite a quantity of iodide to add. Try adding an equal bulk of fresh solution without any iodide.—Ed.]

Talk in the Studio.

Photography and Reproduction.—The Glasgow Art Union have again presented their subscribers with a series of photographs from paintings instead of an engraving. The photographs have been admirably executed by Mr. Annan, of Glasgow. We shall have something more to say on the subject in our next.

Method of Colouring Photographic Prints.—Amongst new American patents is one which has for its principal object the cheapening and increasing the durability of photographic prints, and relates more particularly to a new system of colouring photographs, by means of chemical substances, which so combine with the photographic prints, when applied to them, as to be indestructible either by water, alcohol, or spirits of turpentine, and, moreover, in beauty are equal to, if not superior to, prints coloured by any of the ordinary modes hitherto known or practised, and can never fade or discolour by exposure to the sun or any other light—said chemical substances being of such a nature that they can be readily and easily applied to the prints by any person, whether acquainted with the art of colouring or not.

Artificial Ivory Tablets for Photography.—Finely pulverized heavy spar (sulphate of baryta) is mixed with gelatine or albumen, compressed into sheets, dried, and polished.—*Scientific American.*

Water-proof Paper.—Dissolve 8 oz. of alum and 3¾ oz. of Castile soap in 4 pints of water, and 2 oz. of gum-arabic and 4 oz. of glue in another half gallon of water. Mix both, heat, dip in the paper, then suspend until dry.—*Scientific American.*

Collodionized Paper.—A correspondent sends us some samples of paper coated with collodion in manner following:—"Coat the glass with collodion, and while still wet pour water and acid over the plate—water 1 ounce, nitric acid 4 drops. The film will be ready to leave the glass in four minutes. Lay the paper on the glass, push the collodion up to the paper, lift it gently, taking care of air-bubbles, when it will leave the glass with great ease. This collodion is salted with ammonia." The object is, we presume, to print upon, an experiment which we have not yet had time to try. The process might besides be found an easy one for transferring collodio-chloride prints from glass to paper, by which the fine surface of the glass would be secured.

Murder of a Photographer in Baltimore.—The American journals record a horrid murder and robbery in Baltimore, committed on Sunday, October 29th, about noon, in the photographic establishment of Mr. H. B. Grove, adjoining the "Sun" office. The proprietor was found, about one o'clock, lying dead upon the floor of his operating-room, with a pistol shot in the back of his head. His person had been robbed of a watch and other valuables. Parties in the adjoining building testify to hearing the report of a pistol about noon. No clue has yet been been obtained of the murderer. The murdered man came to Baltimore from Carlisle, Pa. It is supposed the murderer shot his victim while the latter was preparing to take his picture.

To Correspondents.

Erratum.—On page 569, in the 22nd line from the bottom of the second column, 200 oz. of water is a mistake ; read 20 oz.

Pyro.—Mastic varnish is the best for photographs coloured in oil, and will not injure those portions which are uncoloured. 2. Blisters which rise whilst sizing the print for colouring are the result of imperfect mounting, the adhesion of the print to the mounting board not being complete in such parts.

B. O.—All portrait-lenses, when employed to portray a flat surface, will, with open aperture, define a portion in the centre sharply, and will fall off towards the edges ; if the subject were curved to suit the lens, this might be remedied, but the usual plan is to either employ a lens of long focus, or to use a small stop where it is important to have the definition at the edges as perfect as in the centre. 2. Not that we remember.

George Lewis.—We have occasionally met with the film blistering and leaving the paper when an unsuitable sample of paper was used, but not otherwise. The paper which answered best in our hands was that prepared for the Wothlytype process, by Sanford. The defect may arise from the paper, from the collodion being too contractile, and, possibly, from a certain decomposition which we believe sometimes takes place when excess of free nitrate is a long time in contact with the collodion. It sometimes makes the film more rotten.

Studio.—You are misled by the erroneous descriptions too often given of the focus of lenses. It is common to describe lenses in catalogues by the focus from the back lens, which is not the equivalent focus, and of no use in a calculation. The lens described as of six inches focus has probably an equivalent solar focus of eight inches : but in using lenses for near objects, the focus becomes practically lengthened, so that it is probable that, in taking a portrait, the focus of the said lens becomes about nine inches, which, applying the rule we stated, would give eighteen feet between sitter and lens, and if the image were a trifle smaller—and it is sometimes so taken—the distance would be still greater. In the maker's catalogue, which gives the equivalent focus, it is the focus for parallel rays which is stated, and you are not making allowance for the practical lengthening of the focus in taking near objects.

C. H.—In order to acquire full information on the subject of your questions, you should consult an elementary work on chemistry. There are many good books of the kind ; that in Chambers' Educational Course you will find of use. In chemistry it is common, in order to avoid lengthy descriptions of bodies, to express them in symbols which indicate of what elements these bodies are composed. All the simple elements, by which we mean substances which cannot be split up into distinct bodies, are indicated by one or two letters, as you will find on reference to page 91 in our last Year Book. Take, as an illustration, N, nitrogen ; O, oxygen. If, now, we wish to state nitric acid, which consists of a mixture of nitrogen and oxygen, we write it thus, NO_5. The 5 indicates the proportions in which oxygen combines with the nitrogen, to form nitric acid. It is found that all elementary bodies combine in definite proportions, and the proportion is indicated by the combining number attached to them. Thus, the combining proportion of nitrogen is 14, and that of oxygen 8 ; NO_5 indicates that 5 equivalents of oxygen combine with 1 of nitrogen to form nitric acid, the equivalent or combining number of which is thus found to be 54 ; 5 parts of oxygen being 40, and these added to 14, the equivalent of nitrogen, make 54. To illustrate further, take nitrate of silver, written thus, $Ag\ O\ NO_5$, equivalent 170. Referring to silver Ag, you will find its equivalent 108 ; the O which follows above indicates that the proper term for the salt is nitrate of the oxide of silver, as the silver must be oxydized before nitric acid combines with it ; the equivalent of the oxygen, 8, is therefore added to 108, making 116, and this with the equivalent of nitric acid, 54, will give 170. You will thus see that this symbolical notation not only expresses the thing in a short space, but actually indicates the exact constitution of each body. Should you not perfectly understand this explanation, which is necessarily brief, write again.

A Country Subscriber.—Spring water, boiled and filtered, is generally tolerably pure, but not so pure as distilled water ; it may be used for baths in the absence of distilled water. 2. Chiefly suited for landscapes, and would not render architecture satisfactorily. A double or triple combination is best for architecture.

An Earnest Reader.—The process of producing transparencies for the magic lantern would occupy too much space to be repeated here. You will find many articles on the subject in back numbers. There is an excellent article on p. 404 of the present volume, and another method in our Year-Book for 1864. Printing by means of collodio-chloride of silver on plain glass is also a good plan.

Ignoramus.—Simply additional silver as a rule, or a stronger solution made as at first.

Vigorn.—Your suggestion is one which has been well considered. It is probable that next year we shall have a fuller series of articles on the same subject. Your letter, unfortunately, was mislaid, and hence the delayed attention. Thanks for enclosure ; it is amusing enough.

Lux et Salus.—Thanks. The subject shall have attention.

J. A.—The white stick lac is more difficult to dissolve than the ordinary shellac. The spirit should be strong, and solutions should be aided by heat. The addition of a little camphor, and a little essential oil of lavender will aid the solution.

Nitrate.—Immersed until well permeated. 2. The best formula for almost anything is much a matter of opinion ; what one man thinks best is not so regarded always by others. We generally find a lime bath consisting of 3 grains of chloride of gold, 2 grains chloride of lime in a pint of water, work well after it has been mixed a few days. 3. Chalk or common whiting is carbonate of lime, not always quite pure. 4. Your general plan seems good : a white movable screen will answer best to give reflected lights. 5. A portrait lens should be well stopped down in taking views. Its chief advantage is giving straight lines in architecture where it occurs.

Henricus.—The notion that iodized collodion was more sensitive than bromo-iodized collodion is long since exploded amongst practical men. It was not held at the time you mention, except amongst two or three crotchetty persons of little experience on a practical scale. Good bromo-iodized collodion is most sensitive, cleaner, and gives more harmonious pictures as a rule. It is used by the best men, and the very best results ever produced have been obtained by it. 2. The addition of a few grains of nitrate of silver per ounce, and placing in the sun, will throw down any organic impurity in distilled, and fit it for the nitrate bath.

W. T. W.—We cannot explain all that followed the additions made to your bath. Citric acid, gelatine, sugar, ammonia, and nitrate of silver, all mixed in one bath, will produce a curious compound, the exact result of which we cannot predicate. In trying any new formula it is wise to follow it in its simplicity, and, if improvements occur to you, try them subsequently. Trying new formulæ with old baths will often waste time and material.

G. L.—Very good, but a little over-printed, and the tone is a little too inky.

Georgr Avery.—Mr. Ackland attributes marbled markings in the sky to leaving the developer stationary upon the plate, instead of keeping it in motion. He dries spontaneously.

H. X.—The majority of your difficulties are such as experience alone will overcome. We have not met with nor heard of a case in which the gelatino-iron solution is repelled by the plate. The addition of alcohol would not mend the matter. It may possibly arise from the repellent character of the collodion. 2. You can use your opal glass plates over and over ; but by proper care none of the mishaps you describe need occur, unless the sample of collodio-chloride be faulty. 3. A saturated solution may be made by adding the salt until no more will dissolve, but as a general rule you may ascertain the proportion of the salt which is soluble in water. You will find much information of this kind in "Fownes' Manual of Chemistry." The keeping qualities of the new developers must be ascertained by experience. So far as we can judge at present, they are all best newly made.

J. H. W.—So far as we have tried it, the collodio-chloride process answers well for transparencies. 2. It saves trouble to cut and transpose the negative at once when stereoscopic transparencies are printed by superposition. 3. As far as we can see by the description, the printing frame you propose would answer well. 3. The carte lens is constructed with an especial view to defining a standing figure well over ; the ordinary portrait lenses were not so well suited for this.

C. C. Healey.—The iron and citric acid, or perhaps better still, the gelatino-iron solution, will answer best and give the least trouble. 2. We hear very excellent accounts of Carey Lea's plate-cleaning solution, containing bichromate of potash. We know that iodine, alcohol, and tripoli answer well ; or old collodion. Pray don't apologize. It is no trouble to give our best advice.

S.—We have used the body of colour prepared by Newman for illuminating, for stopping out, using red or brown. It answers well ; but we have not had sufficient experience with it to determine whether it will crack.

T. Revon.—(Haute Saone)—A print which has been toned solely with sulphur may be distinguished from one which has been toned with gold in several ways. On submitting the print to a weak solution of bichloride of mercury a sulphur-toned print will rapidly disappear, whilst a gold-toned print will resist its action, merely becoming slightly redder ; on holding a print before a hot fire, or immersing in hot water, both gold and sulphur-toned prints will become redder in colour ; but, on cooling, the gold-toned prints will resume the original colour, whilst the sulphur-toned print will remain red. There are also other modes. A sulphur-toned print very soon begins to look yellow in the half-tones. The chief difficulty in such examinations will arise from the fact that many gold-toned prints are also slightly sulphurized in the hypo-bath. 2. There is no work in England containing such particulars, that we know of. The fullest particulars of the construction of a glass house are published on p. 73 of our Third Volume, where full working details and numerous diagrams are given. A room for the lenses you mention might be twenty feet long, twelve feet wide, and fourteen feet high, built after the plan recommended in our Year-Book. 3. We prefer a north light for the chief side-light. White calico screens for reflectors may be used if necessary. 4. The interior generally may be of any quiet neutral colour, not too light, avoiding bright surfaces, which reflect light irregularly.

B. S.—It is probable that your collodion is too thin, and that the addition of a little more soluble cotton will assist in securing density in the image ; but if, as we suspect, it is an old and decomposed sample, you had better use it for cleaning plates. 2. There are several excellent bromo-iodized negatives in the market, but we cannot recommend any especial maker here. 3. The chief disadvantage you have to apprehend from the use of mercury for intensifying is that the negative may gradually grow harder by exposure to sunlight.

Several correspondents in our next.

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Photographs Registered during the past Week.

Mr. W. H. Warner, of Ross, Hereford,
Photograph of Memorial to Sir G. Cornewall Lewis, at New Radnor.
Mr. Alfred Fisk, St. John Street, Woodbridge,
Photograph of St. John's College, Cambridge.
Photograph of Jesus College, Cambridge.
Mr. Thos. Edw. Seed, Weston-super-Mare,
Photograph of Rev. Charles Woodcock, M.A.
Mr. Enmund Bennett, Rathmines, Dublin,
Photograph of "Cracking a Joke."
Mr. P. Jones, Wrexham,
Photograph of Rev. T. Price, Grand Master of I.O.M.N.O.F.
Photograph of Rev. T. Price, Grand Master, and J. Curtis, Vice-Grand Master I.O.M.N.
Messrs. James Russell & Sons, Chichester.
Eight Photographs of the Bishop of Chichester.
Barnes Brothers, Tenterden,
Photograph of Interior of Tenterden Church.
Mr. James Armstrong, Carlisle,
Photograph of "Drapers' Company, Limited."
Mr. Thos. Gullire, 18, Union Street, Swansea,
Photograph of Railway Accident at the Docks.
Miss E. Burt, Dundee,
Portrait of Rev. John Hart.
Messrs. Cundall & Downes, Harper Street, Bedford,
Photographic Group of Prince of Wales and Party.
Photographic Group of Prince and Princess of Wales and Party.
Mr. J. Pender, Waterford,
Photograph of the Ursuline Convent at Waterford.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 380.—*December* 15, 1865.

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CEMENTING GLASSES ON OPAL PICTURES.

One of the most pleasing applications of opal glass printing is to the production of miniatures for bracelets, &c., and in such case their beauty is increased, and their more perfect preservation secured, by sealing hermetically from the atmosphere and from mechanical injury, by cementing a piece of glass over them, in the manner in which the contact surfaces of achromatic lenses are cemented.

This idea is not new. In America, Daguerreotypes were occasionally sealed in this manner. In the year 1854, Mr. Cutting, of Boston, U. S., obtained, both in America and in this country, patents for certain improvements in photography, amongst which "balsam sealing," as the process was termed, was included. Such a patent was not valid, and has never, we believe, been maintained. Mr. Skaife has adopted the same plan of fitting up and preserving his "chromo-crystals," and Messrs. Helsby seal up their pretty opal pictures in the same manner.

Notwithstanding the want of novelty in the process, the best method of effecting it is not familiar to many, and a few hints on the subject may probably be interesting and useful to our readers. We may presume we have in many cases seen pictures so cemented by means of a strong spirit varnish, and also by the mere application of Canada balsam, in which the result was very unsatisfactory, the cement remaining a long time tacky, and air-bubbles forming between the two surfaces. The spirit in the varnish and the turpentine in the Canada balsam, being confined between the two glasses, are necessarily prevented from rapid evaporation unless heat be applied, and the cementing is thus incompletely effected.

To perform the operation satisfactorily, the Canada balsam, which should be of the best and most colourless quality, should be submitted for some time to heat, to drive off the essential oils which unite with the resin to form a balsam. The heat should not exceed 212°, and should be continued until the characteristic smell of the balsam nearly ceases to be felt. A quantity of the balsam may be thus prepared and kept ready. In indicating its use, we will now simply describe the method adopted by opticians, in cementing lenses, and then add a word or two on the adaptation of the method to portraits.

As it is necessary that the application of heat should be gradual, to prevent risk to the glass, an arrangement is made for the graduation of the heat employed. A ring or plate gas-burner, about three inches in diameter, with a number of very small jets, is provided. Over this, on a wooden frame, is a piece of thin sheet iron, which does not retain much heat when the flame of the gas is reduced. A small piece of the prepared balsam, sufficient to cover the surfaces properly when melted, is then placed between the two glasses, which are then placed on a piece of paper, on the sheet iron, which is now cool, over the gas-burner. The heat is then gradually raised, and the balsam spreads between the two surfaces, the manipulator, with a piece of folded linen cloth, which readily bites the surface in virtue of a slight touch of the balsam with which it is endued, pressing the two glasses together, and working out air-bubbles. When all air-bubbles have disappeared, and all superfluous balsam is removed, the heat is gradually lowered, and the cemented glasses finally placed away to cool. When cold they are found to be quite firm, and the balsam quite hard and clear.

Photographers not provided with the legitimate appliances may improvise them by means of a hot-water bath. One of the ordinary hot-water dishes may serve. This having been filled with the boiling water, the two pieces of glass—the picture and its cover—should be warmed before being placed on it, and in order then to conduct the heat slowly, a card should be laid on the hot dish, and the glasses on the card. Then, by gentle manipulation, the two glasses may be pressed together, and the air-bubbles worked out. The cemented pictures may then be removed, and cooled gradually, and will be found attached perfectly.

Two questions first occurred to us in trying this operation on a collodio-chloride print on opal glass: first, would the picture be injured by the heat? next, would the brilliancy of the print be in any degree lowered? Both these questions were answered, in the result, satisfactorily. The heat had no effect whatever on the picture, and the brilliancy was not lowered by the process or by the effect of balsam and glass over it, the only difference being that the picture is restored to exactly the condition in which it was before it was dried, when originally produced, and looks warmer in tone, and not quite so dark. We have understood that the opal pictures, finished in water colours and cemented, have lost considerably in brilliancy. This is just what we should have anticipated if they were not coloured much too vividly to begin with. The effect of the balsam slightly penetrating the colours would be to lower them, causing them to transmit more light and reflect less light. To secure the proper brilliancy in the finished result, a similar excess of brilliancy in the colouring ought to be secured to that aimed at when a paper print has to be saturated with wax, in order to imitate the effect of ivory.

One or two important points should be remembered. The glass placed over the photographs should be as thin as possible, and quite white; any greenness will materially detract from the effect. The two surfaces should be quite plane; any inequalities will make the operation much more difficult. The two surfaces should be perfectly clean, or the cementing will be imperfect. When the operation is com plete, any superfluous balsam may be removed with turpentine or a mixture of turpentine and alcohol; but great care must be used to prevent this permeating the thin film of balsam already hardened between the glasses.

Where the miniature is intended for bracelets, &c., the two glasses may be reduced to the proper size and shape by means of a cutting diamond and the shanks before cementing; and when that operation is complete, the edges may be ground and polished by the lapidary. A bevelled edge to the upper glass will improve the effect. Some prefer the effect of the upper glass having a convex upper surface, and thus becoming practically a lens. If the upper glass be obtained first of proper size and shape, the glass on which the picture is taken may be cut with diamond and shanks to the proper size and shape, and the two cemented together, and so rendering no after cutting or grinding necessary.

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ON THE VARIOUS METHODS OF ENGRAVING PHOTOGRAPHIC PICTURES OBTAINED UPON METALS AND STONE.

The nearer photography approaches perfection the more evident it becomes that the real aim to which its applications tend is that of printing by the ordinary methods. If we go back to the origin of photography, we recognize that such was the solution sought from the very first, and that it is only later that this side of the problem was abandoned for others. The attempts made in this direction have been abandoned for a long time, and it is only within the last few years that they have been resumed; but they have made, in a very short time, such rapid progress that the moment is not far distant when photographic pictures will be produced upon the largest scale, under conditions suitable for being printed at the press.

We have thought that it would be interesting to publish the whole of the methods now generally employed for engraving the photographs obtained upon metal or stone.

1. *Liquid for Engraving upon Copper.*—Prepare a saturated solution of copper in nitric acid, and a concentrated solution of chloride of ammonium in acetic acid. Mix three parts of the cupric solution with one part of the solution of chloride of ammonium. We thus obtain a liquid which it is only necessary to pour upon the plate of copper bearing the photographic picture, after surrounding the plate with a border of wax to prevent the solution flowing off. The solution must be strengthened with nitric acid, which is added, drop by drop, until it bites well.

The photographic proofs obtained directly upon the plate, by means of bichromate of potassa, must be engraved by means of a solution of chloride of iron.

2. *Liquid for Engraving upon Steel.*—With the following liquid we obtain very fine lines, even when the steel is of poor quality. In 500 parts of alcohol (88° Tralle) dissolve 33 parts of nitric acid, sp. gr. 1·22. The operation must take place at 60° F. When the mixture is complete add to the liquid 0·33 parts of nitrate of silver, previously dissolved in distilled water. This solution may be prepared beforehand.

If the varnish be weak, it will be better to employ the following solution:—

Alcohol	6	parts
Distilled water	9	,,
Pure nitric acid	16·60	,,
Nitrate of silver	0·83	,,

This liquid improves by keeping.

To obtain a design, very clear and sharp, upon steel, we employ the three following liquids:—

a.—The mordant, the formula of which is given above.

b.—Distilled water, to which is added 4 per cent. of nitric acid, sp. gr. 1·22.

c.—Distilled water, containing 6 per cent. of alcohol at 88° (Tralle's.)

Commence by washing the plate containing the picture, during forty seconds or so, with the liquid *b*, quickly throwing off the liquid before it has time to dry on; then cover the plate with the solution *a*. It is understood that the plate must be bordered with wax, and the depth of the liquid covering it must not exceed a quarter of an inch. Immediately this liquid comes in contact with the plate the denuded parts of the metal begin to be covered with a greyish-black powder which must be constantly removed carefully with a soft brush, so as to allow the liquid to reach the metallic parts lying beneath it, and to bite in more deeply. When the action appears sufficient, pour off the liquid and carefully wash the plate with the liquid c, and then leave it to dry. The solution *a* must remain on the plate about three minutes; if it be allowed to remain on longer the plate will become covered with mud, because the mordant is no longer in a condition to act. The final effect aimed at is obtained by repeated bitings; the plate must be well washed between the successive actions of the corrosive liquids, and the operation must be repeated until the lines attain the desired depth. Attention must be paid to the temperature, which, both in the plate, and in the place where the operation is carried on, must never be lower than 66° F., nor higher than 75° or 76° F. Eight minutes' biting at the temperature of 60° F. is equivalent to six minutes at 76° F. The above formula may also be employed with the addition of concentrated acid to the mordant. The pictures obtained upon steel, with bichromate of potassa, may be engraved in this manner:—

3. *Liquid for Engraving electrically upon Zinc.*—The pictures obtained with bitumen upon zinc, those prepared with bichromate of potassa and Brunswick black, may be treated either by the galvanic process of engraving or by Colonel Sir Henry James's process. Of these two methods the latter is the most expeditious. We proceed to describe the first.

Immediately after the development of the picture, and when the varnish is dry, the plate, the back of which as well as the parts not intended to be submitted to the action of the mordant, being coated with Brunswick black, is by means of a copper conductor put in communication with a plate of copper placed at a distance of a quarter of an inch. This galvanic couple is introduced into a solution of sulphate of copper, marking 15° Baumé. The sulphuric acid set free by the decomposition of the sulphate of copper dissolves those portions of the zinc unprotected by the varnish. The plate may be engraved more or less deeply, according to the nature of the design. But as in general, a single pair acts but feebly, it is usually found necessary to put this couple in communication with a battery, if we desire to obtain sufficient depth of corrosion. To give the plate the appearance of a lithograph, the action must be prolonged to about five minutes; if we wish to make a pen-and-ink drawing, we must extend the action to seven minutes. It is to be observed that the sulphate of copper does not attack even the most delicate lines, nor exercise any action on the varnish.

4. *Mordant for Lithographic Stone.*—*a.* For designs formed simply of lines and hatchings, take—

Gum Arabic	4	ounces
Distilled water	14	,,
Commercial nitric acid	2	drachms

We can prepare this liquid either at the moment of using it, or make the solution of gum in advance, adding the acid at the last moment.

b. For designs with half tones, the following liquid is recommended:—

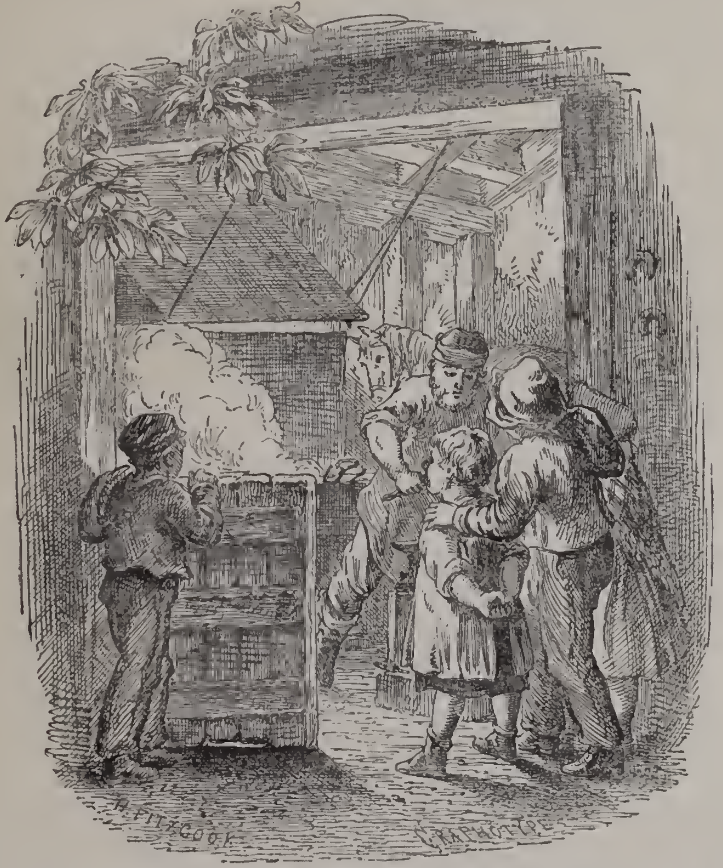
Gum Arabic	4	ounces
Distilled water	16	,,
Hydrochloric acid	2½	drachms

Sometimes, a certain quantity of water is added to this liquid, and a linen rag soaked in it, which is left all night in contact with the picture.—*Photographisches Monatsschrift.*

THE GRAPHOTYPE PROCESS.

As the majority of our readers are interested in all methods which tend to improve and to popularise all the graphic arts, they will read with interest the description of a process recently discovered by an American gentleman, by which the process of wood-engraving will, for many purposes, be superseded by a method producing a printing-block from the artists' drawing by very simple and expeditious means. We may describe it briefly as follows:—A drawing is made with a suitable ink on a surface of prepared chalk; the ink unites with the chalk and hardens it, so that when a brush is applied to the surface, all the chalk not touched by the ink is brushed away in powder, leaving the parts contained in the drawing intact and standing in relief. From this an electrotype in the usual way is obtained, which is printed from at the printing-press along with ordinary type.

Mr. Fitzcooke read a history and description of the invention to the Society of Arts on the evening of the 6th inst., in the course of which some of the drawings in relief on the prepared chalk were produced, and numerous excellent specimens shown. In the discussion which followed, the question was mooted as to whether photographic images could be placed on such surfaces, and printing-blocks produced. Of course such an idea could only be entertained in oblivion of the nature of the photographic image, in which the gradation does not consist of the conventional lines and dots by which gradation is produced in wood-cuts; but it is possible we can conceive that in reproduction photography might be utilized in connection with the graphotype process.



The engraving which we give here, to illustrate the capabilities of the process, is printed at an ordinary printing machine, without the care necessary in working fine engravings.

We give some extracts from the paper of Mr. Fitzcooke, describing the process. After some introductory and historical remarks, he said:—

Unlike most of the other processes which have been discussed by this Society, the discovery of the principle on which the graphotype process is based was not the result of design or calculation, but entirely accidental and unpremeditated. It is due to Mr. De Witt Clinton Hitchcock, one of the foremost draughtsmen as well as engravers in the city of New York.

In the summer of 1860, whilst engaged in the pursuit of his art, the discovery was made in the following manner:—In the course of making a drawing on boxwood, he found it necessary to alter a portion of his design by erasing it and rewhitening the exposed surface of the wood. The material used for this purpose was the enamelled surface of an ordinary visiting card, softened by water and a brush, a method known to mos draughtsmen on wood. This card happened to be one printed from a copper plate, and after the removal of all the enamelling, as described, the artist discovered that the printed letters were undisturbed, and standing up in bold relief.

After describing the early experiments, the process, as now practised, is described as follows:—

The best quality of French chalk is finely ground and precipitated in water. This precipitate is again pulverized and sifted. Thick sheets of zinc or other metal are cut to the required sizes, upon which the prepared chalk is re-sifted through wire cloth having 10,000 holes to the square inch. This is subjected to hydraulic pressure of 120 tons, the chalk receiving a gloss from the surface of a highly polished steel plate. In this condition the thickness of the zinc plate and compressed chalk is about that of an ordinary stereotype plate. The surface of the chalk is then made nearly non-absorbent, by receiving a strong "sizing," which prevents the ink from penetrating, and, consequently, from spreading.

The ink, which, as I have said before, took two inventors months of labour to perfect, is, after all, nothing more than a very careful composition of glue and lampblack; and partaking as it does of the nature of gluten or varnish, it remains upon the surface, acting merely as a guard or protection to the chalk beneath the lines while undergoing the operation of brushing. In a like manner to drawing upon wood, the artist makes a red chalk tracing on the plate, and with sable-hair pencils of various sizes draws his design, line for line, exactly as he desires it to appear when printed, the subject being, of course, reversed, as upon wood. The ink, which is black, dries instantly on being applied to the plate, so that one series of lines of any thickness may be immediately crossed by others.

The drawing is now ready to be brought into relief, or engraved, which is effected by the same means of disintegration as was first adopted by the inventor on that memorable day in the year 1860, not with the same toothbrush, but with brushes composed of fitch-hair. Fine silk-velvet is also used in connection with the brush. The chalk is then petrified with the liquid silox, and is ready for the stereotyper, who may, without injury to the original, make from it any number of moulds.

The process is so delicate that the impression of the thumb wetted with the graphotype ink, skeleton leaves, feathers, and other objects to which nature-printing has been applied, can be made to give beautiful impressions from the type press, whilst the finest hair line that the artist can make will stand equally well with the bolder work.

The graphotype process is also applicable to making the blocks or dies—usually cut on brass—with which the bookbinder embosses the covers of his books, and thus conclusively proves, if anything were needed to do so, the depth of the process, as at least three times the depth is required for this purpose as for printing at press.

In mechanical drawing, the graphotype process cannot at present compete with other methods, inasmuch as the compass and rule are incapable of being used without damaging the chalk surface, and the absence of these aids very materially increases both the labour and cost of the drawing. This difficulty, however, no doubt will be speedily overcome when anyone shall think it worth while to lay himself out for it. That mechanical work can be done well and quickly, even at present, where cost is not a consideration, is proved by the engraving published in the Journal of the Society for the 13th of October, and in confirmtion thereof I cannot do better than read the note appended to it by the Editor of the Journal:—"This illustration is one of the first applications of a new process for producing surface blocks from a drawing. It has been produced for this Society as an experiment. The drawing was placed in the hands of the artist on Wednesday morning, and the metal blocks, ready for the printer, were delivered the following day. It is right to state that, the drawing being of a geometric character in outline, the difficulty of production was greatly increased. It should be added that the drawing, having been placed in the hands of a wood engraver of eminence on Tuesday morning last, it was returned by him as impossible to execute wood blocks in time for this week's Journal."

The ordinary engravers' ruling-machine—by an ingenious adaptation, which you will have an opportunity of inspecting at the close of the meeting—is rendered available to this process for producing quiet water, flat skies, broad tints, and other purposes to which it is applied in steel engraving. In this case the line, instead of being ruled by a point, is made by a metal wheel, which touches, but does not press upon, the surface of the chalk. There is also a little arrangement for gradually feeding the wheels with ink.

As a matter of interest to the members and visitors present, it now becomes necessary to say a few words on the manipulation of the drawings. When the process was first introduced to me, I saw at once that the problem so long and anxiously sought had at length been solved, and though I had never previously made a line drawing with the brush—which, during the last four or five years, has nearly superseded the pencil for drawing on wood—the first attempt I made confirmed my previous conviction. Since then I have secured the co-operation of some of our best illustrators, Holman Hunt, J. D. Watson, Du Maurier, Morten, Hablot K. Browne, Florence Claxton, and others, whose first attempts are here for your inspection. None of them have, I believe, experienced any difficulty other than the strangeness which must necessarily attend the working on a new material, and most of them are enthusiastic at the results of their first trials.

I have also tested the process myself with every kind of execution which occurred to me, and found no practical obstacle to any. There is no greater difficulty in drawing on the chalk with the brush than there is upon paper. It is equally susceptible of after-touching and improving with the wood block, and is as well adapted to free, bold sketching as to great elaboration; results can be obtained with ease such as no engraver can attempt, and new instances of its practical application and development are occurring, and must continue to occur, every day. I feel confident, therefore, that when it becomes practically well known, no real artist will care to submit his work to the tender mercies of the engraver, whilst he can have it so faithfully reproduced by these means.

ON THE MODIFIED FOTHERGILL PROCESS.*

BY WM. ACKLAND.

Having been solicited to say a few words on my modification of the Fothergill process, I promised to do so; but the task is somewhat difficult after the very lucid descriptions given by the Editors of the two weekly Photographic Journals in their respective issues of the 20th October last, and the more so as the late fogs have totally prevented the continuance of experiments necessary to test its merits. I propose, therefore, to defer making any remarks on the advantages gained until a more extended investigation will enable me to speak with confidence, backed up by repeated successful results; and trusting that photographers generally will also test it for themselves, I now propose to say a few words on the solutions and manipulations employed.

The collodion best suited is certainly the bromo-iodized now so commonly used by photographers, and if it be newly iodized, it is a safe plan to add a sufficiency of tincture of iodine to give it a full sherry colour. This does not appear to decrease sensitiveness, whilst any tendency to fogginess is prevented. The bromized collodion and alkaline development have been suggested, and very favourable results obtained by its use, by Mr. Branfeld; but my trials with this collodion did not yield such success as I expected, possibly from my want of intimate knowledge concerning the developer employed. However, there is no difficulty in meeting with a suitable collodion, as samples from different makers which I have tried act very much alike. The only point to be attended to is to select one yielding a full creamy film when excited, and having no tendency to leave the plate in washing.

The exciting bath should be slightly acid, containing not less than thirty-five grains of nitrate of silver to the ounce, and may be conveniently made by dissolving an avoirdupois ounce of recrystallized nitrate of silver in two ounces of water, then adding about two drachms of the iodized collodion intended to be used, and, after shaking well together, to add ten ounces more water, and, after another shake, and an hour or a night standing together, to filter for use. A bath thus prepared will be found faintly acid and in excellent working order without further trouble.

As prepared albumen may be preserved in good condition for years *if kept closely corked*, it saves trouble to prepare a considerable quantity at one time. To do this, carefully separate the yolk from the whites of any number of eggs, and to every eight ounces of albumen thus obtained add twenty drops of glacial acetic acid previously diluted with one ounce of water; stir these together with a glass rod until intimately mixed, which occupies about one minute; then, after resting one hour, strain through course muslin, and to the strained liquid add half a drachm of the strongest liquor ammonia; then preserve in carefully-corked bottles.

Do not be induced to prepare the albumen for the dry process in the usual manner, as a viscid and often opalescent liquid is the result; whereas the above plan, besides occupying less time, yields an albumen very limpid, clear, and bright, and capable of being easily filtered through filtering paper to separate the slight sediment which forms by long keeping.

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* Read at a meeting of the North London Photographic Association, Dec. 6, 1865.

Six other solutions are necessary, to be prepared as follows :—

Solution A.	
Prepared albumen	½ ounce
Strongest liquor ammonia	1 drachm
Water	4 ounces.
Solution B.	
Nitrate of silver	8 grains
Distilled water	4 ounces.
Dilute acetic acid.	
Glacial acetic acid	1 drachm
Water	10 ounces.
Plain pyro solution.	
Pyrogallic acid	100 grains
Absolute alcohol	2 "
Acid pyro. solution.	
Pyrogallic acid	8 grains
Citric acid	2 ounces
Distilled water	4 "
Acid silver solution.	
Nitrate of silver	30 grains
Citric acid	30 "
Distilled water	1 ounce.

The solutions A and B are to be mixed in equal proportions for use, and no more should be mixed at a time than can be employed within twenty-four hours, as decomposition ensues, and foggy plates would be produced.

Having prepared all the above solutions and carefully filtered the bath solution, coat a well-cleaned glass plate with the selected collodion as usual, but allow it to "set" until the last drop at the corner of the plate from which the collodion was drained off is no longer liquid, but is capable of receiving the imprint of the skin of the thumb; then immerse in the bath for from three to five minutes according to the temperature of the room, and after lifting in and out two or three times, take out and place on a tray filled with water, and agitate until the greasiness is removed from the surface; then allow it to rest whilst another plate is coated and placed in the exciting bath. I may remark that distilled water is not required for any of the washings where water of an average quality to that supplied by the London water companies can be obtained. The plate, having been allowed to soak for a couple of minutes or so, is now carefully washed by continued agitation and frequent changes of water for the space of another couple of minutes, and is then removed and flooded with a solution made by dissolving a table-spoonful of common salt in a quart of water. After this solution has remained on about half-a-minute, it is poured off, and the plate washed under a tap or by water gently poured on, so as to remove any of the salt solution that may remain, and is then stood to drain with one of its corners touching the wall, and the other resting on a pad of clean blotting paper. Here it is allowed to remain whilst a second plate is brought up to the same stage, which will occupy about five minutes; but the time is not very important provided sufficient is allowed to drain off the excess of washing without any part becoming dry. Then pour over the surface, so as to avoid the formation of bubbles, a mixture made of equal parts of solution A and B carefully filtered, and allow this to flow well up to each corner and then off into the sink. Pour on and off a second quantity of the same mixture three or four times; then stand up to drain as before described, until from six to a dozen plates are advanced thus far, taking care, of course, that the surface does not become dry. This prolonged draining is not necessary (five minutes is amply sufficient), but it is more convenient and less liable to confuse, to prepare a number of plates up to albumenizing before proceeding to the next operation.

The plate, then, having been albumenised and drained, is now taken and either immersed in the dilute of acetic acid, made as before directed, for a minute, or the acid may be poured on and off repeatedly for about that time. Again wash thoroughly for half a minute, then drain and dry as usual, but avoid employing artificial heat.

My drying-box is a common packing case of deal, about a foot square; this is laid on one of its sides, so that the hinges of the lid (which serves as a door) are upwards. In this one dozen 7 × 16 plates can be dried in a night; but for larger sized plates the size of the box must be proportionately increased.

The plates when drying are so placed that one of the upper corners just touches the box, whilst the lower and narrowest edge rests its whole extent on at least six thicknesses of clean blotting paper.

Of course the plates are allowed to drain off the excess of washing water before being placed in the drying-box, otherwise the interior would be so damp as to interfere materially with the rapidity of drying.

Nothing as to the keeping qualities of plates thus prepared can as yet be said from actual experience, but judging from inference, I should say that they may be depended on for at least twelve months.

The keeping qualities *after* exposure and *before* development are also serious considerations, but I also here speak confidently from the fact that albumen, when once impressed by the actinic rays, seems to possess the power of retaining the latent image for a considerable time without loss, and is in this respect superior to either tannin or gelatine, as tannin is well known to retain the latent image only imperfectly, whilst gelatine rapidly parts with the impression, and requires development within twenty-four hours after exposure to secure good results.

The exposure required by these plates cannot as yet be strictly compared with that of other processes, but I incline to the belief that it is only half as long as for collodio-albumen or Fothergill plates; but this point can only be settled when we have the advantage of good light, and must therefore be deferred until the next spring.

We all know that the development of the latent image requires the exercise of the best skill and careful study, but we have such perfect control over this part of the process that excellent results can be obtained even by the inexperienced.

To develop, moisten the surface of the plate with distilled water; then drop into the developing glass (for a stereo. plate) ten drops of plain pyro solution, and drain the water on the plate into the glass containing the silver solution. Pour this over the plate two or three times, and allow it to rest until the high lights and sky are plainly visible. This will take about two minutes, if properly exposed; but should any insufficiency of exposure have been given, those details may take a much longer time before being fully out. This primary development, however, must not be hastened by employing silver, but should be allowed whatever time it requires. Having secured all the high lights and the main details, even in the deep shades, thrown off the pyrogallic solution, and, if still bright and colourless, add one drop of acid silver solution, and continue to pour on and off until the detail is brought out boldly. Should the pyrogallic solution have become coloured, a fresh quantity must be employed; and, whenever silver is added to the developer, the mixture must be kept constantly moving, as if allowed to remain at rest, brain-like marbling in the sky and high lights will frequently follow.

The negative being now developed, so that all the detail is clearly shown (but of course without any vigour), requires intensifying, in order to give those contrasts so needed to yield a good proof. To do this, use about two drachms of the acid pyro. solution to about ten to twenty drops of the acid silver solution, and pour this on the plate, and keep it constantly waving backwards and forwards until the required intensity is obtained.

During the development we can remedy an error of exposure. If too short a time has been given in the camera, prolong the action of the plain pyro. solution, and use a smaller quantity of acid silver solution in the intensifying; whereas we give an over exposed plate but little time with the plain pyro., and use a full dose of acid silver in the intensifying.

The negative, after washing with water, is now fixed with hyposulphite of soda in the usual manner.

It only now remains for me to state that, since the first publication, I have seen nothing that would lead me to anticipate failures in this process under the ordinary advantages of good light: but the month just past has yielded but few gleams that would gladden the photographer, and has been adverse to extending a knowledge of the good or bad qualities of a process. Some of my correspondents distant from London November fogs write very cheeringly as to the success of their first attempt, none condemning or finding many difficulties in their way; and owing to the kindness of some two of those enterprising amateurs I am enabled to show you a few negatives of what this process will accomplish with a November light.

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NOTES ON THE FERROGELATINE DEVELOPER.

BY JOHN BOCKETT.*

Since our meeting held in October last I have worked with ferrogelatine developers prepared according to Mr. Cooper's formula, and also the amended one. (See Photographic News, pp. 483 and 546.) Both gave good results, although slower in action than the ordinary protosulphate developer; but this was perfectly under control, according to the amount of extra protosulphate of iron added to the solutions. I find that at this time of the year from twenty-five to forty grains may be added. No alcohol was required to make the developer flow over the plate, and, as before stated, according to the proportion of iron added, so can the detail of the negative be quickly or slowly brought out. Any intensity can be obtained, provided sufficient exposure has been given.

In the course of my experiments some curious facts presented themselves, which, however, may be easily explained: 1. The plates, after development, washing, and fixing, took a very long time to dry—that is to say, spontaneously. 2. The plates may be much over-exposed, but still a decent negative can always be obtained. 3. It is almost impossible to fog a negative. 4. In copying engravings, old collodion is so contractile that the film with the ordinary iron developer always splits up, can, with the ferrogelatine developer, be used with the greatest advantage. I find, also, that such a film would not stand, in the case of an under-exposed negative, the addition of silver; but, strange to say, a plate prepared with the same collodion and purposely under-exposed, bore intensification with pyro., citric acid, and silver, and even afterwards with bichloride of mercury and iodide of potassium, to such an extent that, although no half-tone existed, the deposit upon the plate fairly stands out in relief.

In my opinion one great thing should be avoided—I mean the addition of too much gelatine, its retarding action apparently being very great. Not only that, but if too much be added, the difficulty of getting it over large plates is increased, and the solution is apt to retain frothy bubbles.

Before closing these few remarks, I would say to those interested that Mr. Cooper's solution yields some very beautiful crystals for the microscope, giving intense colour with the polariscope, assimilating to sections of hoof, &c. Although the crystals have been termed "glycocine," I believe that substance has not, *per se*, ever been isolated; and although as a show object it is calculated to rank among some of our finest polarising crystals, I should be glad to hear from some gentleman present a better term for these compound crystals.

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NITRATE OF SILVER.—HOW TO TEST ITS IMPURITIES.

BY PROF. TOWLER.*

The profit on nitrate of silver is not great, because the original substance from which it is manufactured—the base of the salt—is, in and of itself, a dear article. The same may be said of the terchloride of gold. On some articles apothecaries and druggists can put on a profit of two or three hundred per cent. without exciting a murmur against their exorbitant charges, because these articles consist of cheap materials to begin with, and may in appearance be sold cheap even when burdened with the immense per centage. Thus you may buy, and probably have brought, an ounce of sulphuric acid, for which with the vial probably you paid a quarter of a dollar; this price does not appear particularly out of the way, and yet the profit is immense! We do not know the exact quotation of the price of sulphuric acid at the present moment; the last we bought cost us in the carboy, if we recollect right, about two cents a pound, or one-eighth of a cent per ounce—the vial is worth two cents—hence the profit will be a little more than a thousand per cent. A handsome profit!

It is impossible to exact the same grade of profits on the two salts just mentioned, as the reader can easily conceive. But because this is impossible, and the craving after unjust profits uncomfortably prevails amongst our very religious and moral people, this craving must be satisfied either by hook or by crook. They take the former experiment—they use the hook—and hook on to the real nitrate of silver and the real terchloride of gold some uncostly substitute, as an alkaline, &c., nitrate or carbonate, whereby the prices of the two expensive salts may remain the same, whilst the profits gradually increase, as the consciences of the manufacturer gradually expand, like the inflated maw of a turkey.

It becomes our duty, therefore, to instruct our readers how to test for the impurities in the adulterated articles.

Crystalline Form of Nitrate of Silver.

It is by far the best to buy nitrate of silver in crystals, and not as lunar caustic or as an amorphous powder. The form of the crystal, when pure, is tubular; so that if octohedral or prismatic crystals are descried amidst these that tubules, you may feel assured there has been an adulteration. If, on the contrary, the crystals are uniformly of a tubular shape, it is almost equally certain the nitrate of silver is pure.

Where there is any doubt, proceed as now directed:—

Testing for Impurities by Chemical Reagents.

Weigh out ten grains of the crystals, and dissolve them in distilled water; now add pure hydrochloric acid to the solution, drop by drop, as long as there is a precipitate of the white chloride. Perform this experiment in the dark room.

Let the precipitate settle; and then add another drop of the hydrochloric acid in order to see whether all the chloride has been precipitated. If this be the case, separate the chloride by filtration, and wash the precipitate in several drachms of pure water, which is mixed with the first filtrate; that is, keep the liquids together.

The chloride may be that of lead or silver; it might also be that of mercury under certain circumstances, but it is not to be expected here.

Supposing that lead is present with the silver, we must now separate the chloride of the former from that of the latter metal by means of ammonia, which will dissolve the chloride of silver, and leave the chloride of lead. If all the chloride is dissolved, we conclude that a salt of lead was not present in the nitrate of silver; and the contrary, if a portion was undissolved.

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* Read at a meeting of the North London Photographic Association, December 6, 1865.

* From *Humphrey's Journal.*

In the liquid, other metals, besides those of the alkalies, might be present; but it is not very probable. In order to be sure of this fact, the solution is first boiled for some time, and then a current of hydrosulphuric acid is passed through the solution, when cool, for a short time; the solution is again boiled and set aside to cool, &c., for an hour or more. Or a few drops of sulphide of ammonia may be added to the solution instead of passing a current of hydrosulphuric acid through it; the solution is then boiled as before, until all smell of ammonia and hydrosulphuric acid has disappeared.

If there is merely *a trace* of a black precipitate, it is evident that several salts (nitrates that might be there) are absent. A copious black precipitate would indicate adulteration with either one or several metallic salts, not one of which, however, is likely to be the salt with which the adulteration might be successfully made.

Filter the solution, and then evaporate it to dryness.

A white sediment (having previously removed all excess of hydrochloric acid by boiling) will indicate the presence of the nitrates of one or more of the alkalies ar alkaline earths.

It would probably be the safer plan to evaporate the original solution at once to dryness, and then, if there is a sediment, to conclude at once that there is adulteration with the nitrates of one or more of the metals. The sediment is then dissolved and proceeded with, as above marked out, with hydrosulphuric acid, &c.

By proceeding in this way there is no risk of forming the chloride of ammonium, in case the sulphide of ammonium had been the reagent used.

As the object of the operator is simply to ascertain whether the nitrate is pure or adulterated, it is not necessary to point out by what means the analysis may be completed so as to indicate the precise metal in the adulteration where it exists. Such an analysis would be long and without any special aim for the practical photographer.

BROAD LIGHTS AND SHADOWS IN PHOTOGRAPHY.

BY REV. H. J. MORTON, D.D.[*]

Nothing strikes a casual observer of natural scenery more than the different aspects which the same landscape bears at different hours of the day. Without exactly knowing why, the resident in some romantic or commanding region of country will take his visitor to the selected point of view, if he wishes him to enjoy the full beauty of the scene, either in the morning or in the evening. The landscape is then particularly attractive. Why? The simple answer is, because of the lights and shadows which lie spread over the scene. The grand hill ranges send great sweeping masses of dark along the plains; the forests are distinct lines, with borders of light trembling along the edges, and fringing, as it were, the belt of deep and varied green stretched out beneath. The face of the landscape is then like the face of a man, with distinct features, with a definite expression; and the spectator pauses, delighted. The idea, too, of *rest* seems to be suggested by the scene. The hills appear to be lying down, spreading their mantles around their feet, and preparing for repose; the trees are like sitting figures—labourers resting from toil, their long shadows stretching out like the lower limbs of harvesters ceasing awhile from exertion, and looking about them on their work. Not so at mid-day. Then the sun glares over all the visible space; the trees stand up, as it were, wearily on their shadows, the hills on their burning bases; the eye tires of the spectacle, and turns away disappointed.

It is true, if the day be one of passing clouds, the effect produced is in some degree analogous to that of moving or wavering lights—but not so perfect, the shadows lying in patches, and often obscuring what the eye asks to have revealed, sending near objects far off, and bringing far away points nearer, and, as it were, disturbing the order of nature.

Now, with these familiar facts constantly before us, it is surprising to find photographers so rarely availing themselves of opportunities thus afforded of making fine landscapes. They generally select the hours nearest to mid-day for taking views, and so lose this special charm of light and shade. That phase which pleases in nature is likely to please in a photographic representation of nature, and the grand and massed lights and shadows of morning and afternoon, when transferred to the negative of the artist, delight the eye of the spectator in the room as much as they do the eye of the spectator watching them from the hill-top. In turning over a series of photographs lately made on the Hudson River, we were strongly impressed with this fact. All were equally admirable as photographs, but some were particularly pleasing as pictures; and on examination, it appeared that the most agreeable landscapes were those taken at one or other of these two periods of the day—either some time before noon, or some time after it. The mid-day views were comparatively flat and void of effect; those made in the morning and evening sparkling and impressive.

There seems to be more repose in the atmosphere, also, at the last-named periods. There is none of that trembling heat-haze which interferes seriously with perfect vision. The air seems to be a motionless medium for the light to travel through, and the exhalations of blazing sands or simmering streams are as yet undisturbed or have subsided. The "days" of the photographer (we think) should be like the days of creation, "and the evening and the morning were the first day."

Proceedings of Societies.

London Photographic Society.

The usual Monthly Meeting of the London Photographic Society was held in King's College, on the evening of Tuesday, December 12th. Dr. H. G. Wright took the chair.

The meeting was the largest we ever saw assembled in the room, being crowded to excess in every part, and a warm interest was manifested in all the proceedings. A number of magnificent specimens of enlargement, plain and coloured, by Mr. Mayall, were on the walls, and a large number of fine specimens of various kinds on the table.

The minutes of a former meeting having been read and confirmed,

The Chairman rose and said that the council had been delayed in their deliberations somewhat longer than usual by the consideration of an important question, into which they had gone with great care, and the nature of which the meeting would glean from the resolution passed in the council unanimously, which he would read. The resolution read was to the effect, that Mr. Glaisher having laid before the council the complete correspondence which had passed between himself and Mr. Dawson, they regarded the statements which had appeared in the *British Journal*, personal to Mr. Glaisher, as entirely unfounded and unjustifiable, and that Mr. Glaisher had been seriously and unfairly attacked. A special meeting of the Society was therefore called for December 19th (next Tuesday), before which the whole question would be brought. He felt sure that he would carry with him the concurrence of the meeting in stating that it was due to Mr. Glaisher that he should not rest under unfair imputations (applause). He would now move that Mr. Glaisher take the chair and preside over the present meeting.

Mr. Glaisher having taken the chair, said that he had felt obliged to tell the council that, charged as he was with dishonour in the *British Journal*, he could not occupy that chair. He felt that no one whose honour had the slightest taint upon it ought to occupy such a position. The council had made arrangements, therefore, for the special meeting next Tuesday, when he hoped every one would attend, that the whole case might be fully heard. They would hear the whole correspondence read, and it would be for them to determine whether his conduct was right or wrong (applause).

The following gentlemen were then proposed, and duly elected by ballot, in the course of the evening:—Messrs. Nelson K. Cherrill, Joe. P. Mayall, John Mayall, Edwin Mayall, and T. P. Collins.

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[*] From the *Philadelphia Photographer*.

The Chairman then said that, in accordance with Rule 7, he would announce the names of the retiring officers and those suggested by the council for succeeding them. The members of council who retired were Messrs. Hennah, W. W. Vernon, Shadbolt, and Major Gresley; and those proposed for election were Messrs. Jabez Hughes, King, Russell Manners Gordon, and E. Kater. Mr. Bedford was proposed for re-election as vice-president; Mr. Hamilton would retire from the office of treasurer, and take a seat in the council; and Mr. White would take his place as treasurer.

The Chairman then read Mr. Woodbury's paper on "A New Method of Photo-Relievo Printing" whilst Mr. Woodbury prepared to demonstrate the method of working.

Mr. Sebastian Davis said, if he understood Mr. Woodbury aright, the photographic part of the operation consisted in obtaining the original relief in gelatine and bichromate, the different degrees of relief being produced in proportion to the action of light through the negative.

Mr. Woodbury having concurred in the remark,

The Chairman suggested that Mr. Anthony, from New York, who was, he understood, in the room, should make a few remarks on the new photographic paper invented in America, whilst Mr. Woodbury made his preparations for demonstrating.

Mr. E. Anthony said the paper referred to was not his own invention, but that of Mr. Brinckerhoff. His aim had been to produce a paper having a hard, dead, white surface without lustre, on which an artist might colour as freely as on ivory, the fibre not working up, in which the high lights might be scraped out, or colour freely worked on, without sinking into the paper. This he thought he had secured, as the specimens would illustrate. For plain paper prints the image was kept on the surface, and the paper gave as good results with a 30-grain bath as ordinary paper with a 60-grain bath.

Mr. Mayall asked if the exposure differed from that of ordinary paper.

Mr. Anthony thought not.

Mr. Mayall, after expressing the pleasure the society had in giving a gentleman distinguished in America in connection with photography a courteous reception, said that he had tried a piece of the paper Mr. Anthony had recently given him. The weather had not been favourable for experiment, but, so far as he could judge at present, it possessed many advantages over plain paper. The preparation having been patented, of course we should in time know more about the matter, and in the meantime, we could not give any absolute opinion on the subject. He remembered patenting a method of doing without paper altogether, but the material absorbed so much hyposulphite it was impossible to get it out again, and he had let the matter drop; he had recently, however, he thought, found out how to fix it properly. It had struck him regarding this paper whether the inventor might not possibly have used some portion of his material to prepare the paper. He might suggest in the absence of any actual knowledge of the mode of preparing this paper, that a mixture of isinglass, alum, and gelatine, would produce a similar result. Another mode he felt certain would give good results would consist in dipping paper slowly into collodion and drawing it slowly out, thus availing themselves of a modification of the process recently introduced by his friend Mr. Simpson, whose process was one of the most important contributions to the art made since photography was invented. The substance which he had before patented was artificial ivory made of gelatine, fish glue, and sulphate of barytes. Isinglass was invaluable in keeping the image from sinking into the surface. Gelatine, isinglass, and a little alum boiled in water and applied by floating, gave an excellent surface. Rice, and all that class of substances, was, of course, available in a similar manner. He thought a paper going into the whole question would be well timed, and should have pleasure in writing one himself, or assisting anyone else to do so.

The Chairman thanked Mr. Anthony for bringing this paper before them, and hoped he would convey to American photographers the information of the acclamation with which he had been received. English photographers were glad to enter into friendly relations with their American brethren, and many of their names—that of Mr. Carey Lea, for instance—were often mentioned here.

Mr. Callaghan exhibited some large specimens produced by Steinheil's periscopic lens, calling attention to the extremely small diameter of the lenses used in producing such small pictures.

Mr. Hughes asked for more definite data, such as the focus and aperture of each lens, as well as the angle included. With these proper data, photographers would know at what cost of exposure they got the larger size and angle of the pictures.

Mr. Callaghan said his information at present was very meagre. The largest picture, 32 inches long, was taken with a lens of 22¾ inches focus; the next was taken with a lens 13¾ inches focus; the stop was 1-8th of an inch. He hoped shortly to receive more information from Mr. Voightlander, who was making the lenses.

The Chairman, referring to the adjourned discussion on the iron developer, said it could not take place to-night, but must be postponed. Mr. Hughes had promised to open it with another paper, and he hoped Mr. Cooper would add some further information, so that the Society would really gain by the delay.

Mr. Johnson exhibited some very fine large specimens of Swiss scenery, by the pantascopic camera, including 125°.

Mr. Woodbury then proceeded to exhibit his mode of printing, and produced several pictures; a conversational discussion proceeding in the meantime, in which the method was explained, and the principle upon which it was based, which Mr. Mayall thought was really casting rather than printing, the picture consisting of a thin cast of coloured gelatine. In answer to some questions, Mr. Woodbury said that one man working three presses could produce three pictures in a minute. The gelatine and colour for four or five hundred would perhaps cost sixpence; the paper could easily be estimated. The plates did not suffer much from the process of printing. A desultory conversation on the principles involved in the mode of printing, and its difference from ordinary printing with opaque ink, followed, in which Dr. Anthony, Mr. Cole, Dr. Wright, Mr. Mayall, Mr. Hughes, Mr. Cooper, and others took part.

Mr. Davis suggested that mechanical difficulties would be experienced in working with large plates, and a discussion on the subject followed.

Mr. Mayall referred to the method of etching Daguerreotypes attempted many years ago, and thought that they could have probably been printed if this method had been tried.

Mr. Hughes referred to the experiments of Mr. Goddard, which showed that a Daguerreotype plate exposed sufficiently long, and then submitted to hyposulphite without first being placed above the fumes of mercury, was found to possess, when the unaltered bromide and iodide were removed, an image in intaglio, with depressions, exactly registering the amount of the action of light, and that such a plate would probably print by this process. Thus, one of the earliest and the latest improvements were placed in direct relation to each other.

After some further conversation, a vote of thanks to Mr. Woodbury was passed by acclamation.

The Chairman called attention to a number of very magnificent carbon prints by Mr. Swan.

Mr. Wharton Simpson called attention to a fine specimen of large size of Mr. Swan's photomezzotint process, printed by a method analogous to that Mr. Woodbury had just exhibited. They were both independent inventors; but Mr. Swan used a somewhat different method. He electrotyped one of his carbon prints whilst it was still wet, and printed from the electrotype *cliché* thus obtained. He might mention also that Mr. Swan, having brought his carbon process to a state of certainty as to exposure by means of a simple actinometer, would, at an early meeting of the Society, exhibit and explain its operation.

After some further conversation and some votes of thanks, the proceedings terminated.

North London Photographic Association.

The ordinary Monthly Meeting of this association was held at Myddelton Hall, on Wednesday, December 6th, Mr. W. Warwick King in the chair.

The Secretary read the minutes of the last meeting, which were confirmed; after which,

Mr. C. E. Elliott, of Jewin Street, was elected a member of the Association.

Mr. H. Cooper, Jun., then read a paper on "Improvements in Photographic Processes, and the Organico-Iron Developer." (see p. 581).

The Chairman, in proposing a vote of thanks to Mr. Cooper for his admirable paper, remarked that it was one of a thoroughly practical character, and demonstrated how useless was anything connected with art without that practical work which must ever precede the theory of that art.

Mr. Cooper exhibited some exceedingly charming specimens produced by the new organic developer, and expressed his regret that through ill health he had been prevented from printing several negatives which would have illustrated different points of interest. He hoped to be able to produce further illustrations of his remarks before the next meeting.

Mr. Bockett read a short paper on the same subject (see p. 594).

After a vote of thanks to Mr. Bockett,

Mr. Cooper said he had been requested by Mr. Simpson to hand round some pictures by Mr. Jabez Hughes, which had been produced by one application of the new aceto-gelatine developer. These were much admired.

Mr. Foxlee remarked that his experience with the developer had been limited. He found that with a slow light, in which by the ordinary developer he could get out a picture, he obtained with the new developer too much intensity before he got out the details of the picture. Mr. Hughes's formula for a strong light in summer, and copying, he thought, as the result of his experiments, was invaluable; but in winter, when the picture required a great deal of forcing in the development, it was scarcely so good as the other.

Mr. Cooper said that was just where he had found the benefit of it, and he believed that in very weak light, and when great forcing was required, the new developer had special advantages. To illustrate this, he stated that one of the pictures he had exhibited was taken on a wretchedly dark morning, and so unsatisfactory did it seem that he thought at first it hardly worth proceeding with. However, having resolved to try, he took some of the organic developer and added to it some plain solution of iron (60 grains to the ounce), and with that he forced the development. He then added a little silver and continued the operation. The result was that he got a picture free from stain and not too intense.

Mr. Russell Manners Gordon, in reply to the Chairman, said he had merely used Mr. Hughes's modification of the developer, and so was hardly qualified to express a very decided opinion upon the subject. He thought that in principle Mr. Cherrill's formula was certainly the most valuable. In his (Mr. Gordon's) hands, Mr. Hughes's modification seemed to want double and treble the exposure that the ordinary iron developer required; and even then, although it added slightly to the intensity, it hardly gave the same amount of detail.

M. Mackay said he had found that in his experiments in dull light in London he got too much intensity—a coarse negative—but in a good light he could quite understand that it might be otherwise.

Mr. Allen was inclined to think the fault in reference to failures must be in the exposure. As far as his experience went, it appeared that this developer took rather longer than the ordinary 25 or 30 grain solutions.

Mr. Hart remarked that, the weather being very dull, he had occasion to copy a few engravings, for which he used a stereoscopic lens with ⅜ths stop. After an exposure of ten seconds, he developed with 2 drachms of gelatine in 1 ounce of sulphuric acid neutralized with ammonia, and made up to a 20-ounce solution. He did not find that his pictures fogged, nor that he got too great an intensity; on the contrary, he obtained a very nice printing negative in that time.

Mr. Hooper had tried the aceto-gelatine developer with portraiture, and his difficulty was to get sufficient intensity. After having forced some copies considerably to gain sufficient intensity, he found the following morning that the plates, although varnished, were covered with spots, and the copies very much more intense.

Some further desultory conversation closed the discussion.

Mr. Ackland read a paper on "A Modification of the Fothergill Process" (see p. 592).

The Chairman said this was a process which promised to be of the greatest service to photographers, especially to amateurs. With regard to the tannin process, he had found it work very badly from its extreme uncertainty. It depended entirely upon the state of the collodion, and upon that they could very little rely. In reference to the keeping qualities of plates prepared by this process, he mentioned that he had recently developed some pictures exposed about three weeks previously, and found that they had suffered no deterioration. He trusted that the members of this Society would not fail to give weight to the paper just read, and that the result of further experience would be to make the process more nearly a perfect one. He proposed a vote of thanks to Mr. Ackland, which was carried.

Mr. Ackland, referring to a remark by the Chairman, said one reason why on all occasions a stronger bath than usual should be employed was, that the proportion of iodide in the bromo-iodized collodion mostly sold in London contained nearer 6 grains than 4. If a bath containing 30 grains of nitrate of silver to the ounce was necessary for the 4-grain collodion, they ought to employ a bath of nearer 40 grains for the 6-grain collodion.

The Chairman called attention to some beautiful photographs taken by Mr. Frith by means of Ross's doublet—Views in Switzerland; and to some other pictures, forwarded for inspection by Mr. Ross, for which he was sure the meeting would thank him.

Mr. Taylor exhibited some fine specimens by Mr. Anthony, of New York, upon porcelain paper, which were much admired.

Mr. Collis exhibited some frames for printing upon opal glass in various sizes.

Mr. Edmund Fox presented to the portfolio of the Association a photograph of the Old Mill on the Holme Wood near Dorking, and two views of Clapham Common.

The Chairman announced that the presentation plates of the Association would be ready by the January Meeting, and that any member desiring to have his copy unmounted should signify the same to the Secretary.

The proceedings then terminated.

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Correspondence.

FOREIGN SCIENCE.

[FROM OUR SPECIAL CORRESPONDENT.]

Paris, December 13th, 1865.

I spoke recently of the amplified printing organized by M. Numa Blanc. I think it will not be uninteresting to the readers of the Photographic News if I describe another important Parisian establishment. I allude to M. Pierson's albumenizing and photographic printing office.

I do not know if English photographers in general albumenize their paper themselves. At Paris our portraitists have much too little space, and their operating-rooms and laboratories are too encumbered, to allow of their adding thereto the necessary appliances and *personnel;* so they buy their paper already albumenized. The chief houses which supply them are Marion, Julian, Guillemmot and Berthaud, Schœffner and Mohr, and François Pierson. These manufacturers are therefore responsible both for the excellence of the paper, and for the perfection of the albumenizing. Nearly all of them have established their workshops in the faubourgs of the metropolis, and that from economical reasons. M. Pierson, on the contrary, is established in the richest quarter of Paris, at a few steps from the Boulevard des Italiens—that is to say, in the very centre of photographic business. Only, it is at the top story of an opulent house that he has fixed his dwelling. This system has its advantages as far as customers are concerned, besides some others which I will speak of presently. I will not describe the manufacture of the albumen, nor its application to the paper; I will only say, that M. Pierson has invented a very ingenious machine for whipping the egg-white. Not only is the work done much more rapidly, but is also far more regular, as the human hand naturally gets fatigued with that kind of labour. A very high temperature is necessary, as you know, for the albumenizing operation; but this heat is injurious to the stock of albumen as yet unemployed. To obviate this inconvenience, the receptacles containing the albumen are placed in a sort of cupboard, which is kept in constant communication with the outer air, and the workmen take the necessary quantity only at the moment it is required. The manufacture is so organized as to produce several reams of prepared paper per day, which represent a very respectable number of pictures delivered to the public.

Close to his albumenizing workshop, M. Pierson has established a photographic printing office, which appears to me to be very judiciously organized. The floor that he occupies is provided with a tolerably wide balcony or terrace, which has a southern and eastern aspect, so that it is exposed to the direct sunlight from the morning to the evening. Along the outer walls, between the windows and up to the roof, M. Pierson has arranged iron *espaliers*, light, strong, and easily removable. On these, more than a hundred *chassis* may be exposed to the light, and all within easy reach. Above these rows is a glass pent, to shelter them from the rain, which may be raised or lowered by means of a mechanical contrivance. Several hundreds of *chassis* carefully piled up in the chambers adjacent to the dark room and the toning-room, together with a considerable number of negative-boxes, may give some idea of the immense number of photographs that are bought by the public.

To these details I will add, that the copies that leave this establishment are remarkable for their careful printing, and prove the utility of a good organization in such business.

The last meeting of the French Photographic Society offered but little interesting matter. We had, however, the opportunity of admiring some fine pictures exhibited by M. Pesme, and obtained with Ross's wide-angle lens; also some very remarkable specimens of charcoal photography, sent by M. Levan; likewise a whole collection of pictures, due to the Infante Don Sebastian, who may be considered as a very clever photographer, although he is a prince.

M. Martens sent a note on the panoramic camera, that I have already described, and the Abbé Moigno submitted to the inspection of the Society, a few specimens obtained with Steinheil's periscopic objective.

Such is the summary of the proceedings of the meeting.

Ernest Lacan.

PHOTO-ENAMELLING.

Messrs Poitevin and Lafon de Camarsac's Enamels.

Sir,—Will you allow me to ask you again, and for the last time, I hope, the hospitality of your paper for a few more lines on photoceramic in general, or the art of transferring photographs to ceramic substances, and especially on the enamels of Messrs. Poitevin and Lafon de Camarsac, described and compared in one of your preceding numbers by Dr. John Anthony, on his return from Paris.

I do not wish to enter into a close discussion with that gentleman about his *impressions de voyage*, but it seems that in attempting, as I have previously done, to justify Lafon de Camarsac of the kind of blame thrown upon him for his reticence or concealment, I have very badly expressed myself, should any one draw from my remarks the proposition which Dr. John Anthony sees in it, that "the concealment of a discovery in an art is a positive benefit to those who practise that art."

The enamels in question have long been known to us, as more than ten years have elapsed since Lafon de Camarsac presented his first productions to the *Académie des Sciences* on the 11th June, 1855. From that time he has been occupied daily in the work of enamelling photographs, which he has gradually brought to the highest state of perfection.

M. Poitevin, on the other hand, engaged in researches concerning several processes, such as lithophotography, heliography, helioplasty, &c., has found out a process of enamelling, the results of which he communicated to the *Société Française de Photographie* in June, 1863; but, as Dr. John Anthony admitted in his first letter, M. Poitevin is far from being a good operator, and, feeling his own inability to carry out his discovery, he made it known to the public, no doubt with the idea that some one would ultimately perfect what he himself had commenced.

The facts thus established, I protested against any comparison being made between the different conduct of the inventors of these two processes, one of which is in full valuable operation, while the other is, as it were, in its infancy.

I said I should not incriminate the merit and disinterestedness of M. Poitevin, whose genius and kind-heartedness I admire quite as much as Dr. Anthony may do; but I do not think it is fair to put on the same footing a perfect process and an imperfect one.

Perfection is the great aim in art, and, according to my humble opinion, he renders the greatest service to an art who brings it to its highest point of excellence and efficiency. Whether he gives his secret or not it does not matter to me; the most important is the result which he obtains, and all other considerations are merely personal. Competition is open to all, and, if one has succeeded, others who work in the same art may hope to succeed also.

If you admit trade secrets, why disapprove of art secrets?

If an artist, after many years of experiment and labour, masters his art, and finds out particular processes of his own, why should he abandon at once the benefit of his discoveries in favour of those busy brains who vaguely or never thought of it?

I have not the honour of personally knowing Dr. Anthony, but I really wonder that he expected, in paying M. Lafon de Camarsac for one of his enamels, to obtain at the same time his secret.* That M. Poitevin has been more communicative I readily believe, since he had already published his discovery, having till then obtained no advantage from it. Without being indiscreet, I can fairly vouch it was not without a previous essay, for I was personally in relation with him on the subject two years since, and if his proposition fell to the ground, it was simply because I did not consider his enamels in a sufficiently advanced stage of perfection, nor myself capable of improving them.

That M. Gobart should succeed with the Poitevin process astonishes me not, since, by practice and research, many an incomplete process, at first, may finally be perfected. Moreover, M. Gobart, applying himself to the reproduction of printed matter, has not to struggle against the same difficulty which is met with in the impression of images taken from nature. The reproduction of drawings, engravings, lines, characters, &c., has no half tints, nor rounded contours, no deep shades nor bright lights; the image consists but of two tones, black and white, and the transfer of one of these negatives to a lithographic stone, copper or steel plate, or even wood block, is done daily in engraving.

Will the Bank of France (where M. Gobart is *employé*) henceforth issue enamelled notes? It would, indeed, be a singular innovation, but one I would rejoice at, if accompanied by a fall of the discount in commercial and a rise in photographic paper.

After M. Poitevin or M. Gobart shall have improved their processes, and produced perfect images from nature, such as portraits or views, I shall be the first to applaud and felicitate them, for, as I said before, I attach importance only to the beauty of the result. I have protested against the reproach of reticence brought upon Lafon de Camarsac, for there is no reticence when no confidence has been promised.

However, it appears I have either very badly expressed myself, or been still worse understood, for I never intended to parade M. Lafon de Camarsac as a benefactor to humanity, because he enamels for every one and from every negative forwarded to him. Although a foreigner, and consequently obliged to write in a foreign tongue, I know enough of the value of words not to confound a service with a benefit.

If a photographer were to discover a remedy for cholera, croup, madness, or even the cattle plague, unknown to any learned doctor, he would decidedly have a just title to the one of benefactor to humanity.

If, on the other hand, a doctor were to discover the method of reproducing natural colours by means of photography, he would be considered as rendering a service to art; and now I assert that Lafon de Camarsac does render service both to the art and the profession, if, in confining himself to the simple occupation of a photographic enameller, he assures a constant success in one of the most difficult and most delicate of operations.

The impression on enamel, and on all ceramic substances, in fact, requires a very different study to that necessary to the impression by the ordinary method on paper. We can improvise ourselves neither as enamellers nor ceramists, and those who professed these two arts in ancient times at the "Renaissance," or even in our own age, have always kept for themselves secrets of fabrication, evidenced by the great variety of their productions, and by the occasional or total loss of these mysteries.

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* It is right to remember that the possession of M. de Camarsac's secret could have been of no value to Dr. Anthony, whose only interest in photography is that of an ardent amateur, and his regret that the process should remain secret could have no personal motive.—Ed.

If we study the ceramic art in the different phases it has undergone, we shall discover that it is one whose origin mounts to the highest antiquity. Samos, Athens, Etruria, were of old distinguished by the importance of these productions, and their extreme beauty and finish. Samos furnished in abundance objects for table use (*vasia Samia*), but it was there more a trade than an art, for these latter potteries have never been renowned for elegance. At Athens, on the contrary, where the manufacture of pottery assumed so great a development that a whole quarter of the city was styled the "Ceramic," from its being the exclusive habitation of the artists and workmen employed in these establishments, the ceramic productions were of the highest beauty; the most perfect pieces were exhibited during the *Panathenea*, and presented, filled with oil, to the victors of the games.

This superiority in the Athenian products was not alone due to the quality of the clay, taken from Colias, near Phalere, but to the elegance of their form, which was their distinctive type, and one of which the Athenians were so proud that their money even bore the emblem of an *amphora*. Among the potters and painters who decorated the vases are cited: Talus, nephew of Dedalus; Corœbus, of Athens; Debutadas and Telephanus, of Sicyon; Thericles, of Corinth, as well as Cherestrates.

Etruria and principally the cities of Anctium and Tarquinea were noted for the art of vase making. The Roman temples were adorned with Etruscan productions, the most remarkable of which was a car, drawn by four horses, placed over the front of the temple of Jupiter Capitolinus.

The painted vases known by the name of Greek, Italian, or Etruscan ceramic, were devoted to decorate public buildings, funeral monuments, or private dwellings; they usually represented mythological scenes, Bacchanalian subjects, wedding feasts, hunts, gymnastic contests, or dances. Valued for the beauty of their form, the fineness of their material, and the perfection of their varnish, they show paintings often of exquisite design, and reveal entirely one portion of antique art. They are also of the greatest interest to the archæologist, both for mythology and history.

Beyond the countries which to us are the classic antiquity, the empire of China manufactured pottery of high perfection; two centuries before the Christian era she had solved the problem of producing hard china, holding water and capable of standing the fire, superior, in an industrial point of view, to the works of Greece or Etruria, but far inferior for their artistic qualities.

Modern Europe arrived but late in the manufacturing of pottery similar to that of China. To pass from a rude state to one of relative perfection in regard to solidity, utility, and beauty, pottery required going through some ages of essays and efforts; but, from Bernard de Palissy till Wedgwood, it has rapidly progressed, thanks to the development of science, particularly of mineralogy, which has discovered many elements fit for the manufacture and decoration of pottery, and chemlrtry chemistry also, which has shown the means of employing them.

Enamel, whose origin appears equally Greek, by its etymology, *smagdos*; Latin, *esmaltum*; French, *émail*, is, properly speaking, a composition of calcined glass, salt, and various minerals. It is employed in covering ceramic substances, or laid on plates of metal, copper, silver, or gold. The ancients used coloured glasses and enamelled metal plates, but their manufacture was mostly in Italy and the east. In the Merovingian monuments, such as the remains of the tomb of Childeric (*Musée des Souverains au Louvre*), in those of the discovery of Gourdon (*Cabinet des Médailles de la Bibliothèque Impériale*) the leading ornament is enamel. From the thirteenth century Limoges was famous for its enamels on metal (*opus de Limogia—labor Limogiæ—opus Lemoviticum.*) These enamels were laid on the bishops' crosses, cups, pixs, reliquaries, shrines, tombs, all kinds of vases, collars, candelabras, cups, clasps, handles, dishes, plates, chests, helmets, sword and knife handles, &c. In the fourteenth century the jewellers of Montpellier rivalled those of Limoges; their art, staid by the unhappy war of one hundred years, re-assumed a new splendour in the sixteenth century, and it was then, without doubt, they adopted the Italian process of enamelling in colours spread over metal, and no longer encased in a bed.

Leonard was named director of the manufactory re-established by Francis the First; among the admirable specimens left by him may be quoted the medallions on the tomb of Diana of Poitiers, and the portraits ot Philippe de Chabot and Francis de Guise, preserved in the Louvre.

La Renaissance produced, in France, a large number of works of this class, chiefly remarkable for their design and artistic execution. The most celebrated artists, in the later times, are Jean Tontin, jeweller, of Chateaudun (1650); Gribelin, Dubié, Morlière, master of Vanquer of Blois (1670); Pierre Charlier, of Blois, a very skilful flower painter. Jean Petitot, of Geneva, dead in 1691, executed portraits regarded as *chefs-d'œuvre*; his brother-in-law, Bordier, dead in 1690, acquired also, in the same style, much fame and much fortune.

Enamel painting now begins to arise from the decadence and neglect into which it had fallen, and reckons some clever artists.

Looking at the interest the arts of ceramic and enamelling call forth, should we not rejoice at seeing photography united and so marvellously adapted to the two?

Not only does photography become unalterable in being transported to enamel, but it moreover gains an incontestable superiority over every other kind of printing. Dr. J. Anthony himself said so in his first letter, of the 18th October, and thus far I am happy to quote his authority. He had occasion, a few months ago, to send a negative portrait to Paris, for M. de Camarsac to print on an enamel, and, though he had already the very finest impressions which could be made on albumenized paper, yet these were very far excelled by the enamel, not only in the superior quality of the blacks and whites, but in the circumstance that the detail of the negative was all rendered by the enamel, much more than the best vision could make out in the paper proof.

And what a new field open for its use—from the decoration of valuable vases even to the enamelling of furniture and precious jewels!

During the last years photography has easily acquired popularity, by the modicity of its price and the rapidity of its production; it will to-day gain the elevated rank it should, occupying among the liberal and industrial arts, by the finished and perfect character of works truly remarkable.

I speak, then, in all sincerity, and in no way to impose on the credulity of any one, when I aver that Lafon de Camarsac renders a veritable service, both to art and to the profession, in devoting himself to the perfect execution of enamels, the success of which depends entirely on himself. I speak for those who, like myself, are continually in relation with the public, and consequently limited in the time they can afford for research and manipulation; and, I say, from the moment the defective part in photography till now lies in the methods of impression, all who assure the durability of images, in transporting and fixing them on ceramic, metallic, indeed on any solid substance, render us a real service, for to them we owe the duration of our works. Let them be Lafon de Camarsac, Poitevin, Garnier, Fargier, Pouncy, Wothly, Simpson, Swan, or Woodbury, they have a right to our acknowledgments, according to the practical utility of their discoveries, whether they make known their secret or practise it themselves, they still render us a great obligation.

I make no narrow question of nationality, for every country has its genius; the names of Daguerre, Fox Talbot, Archer, Legray, &c., belong to the world even as their discoveries. I shall not, therefore, thank heaven for what the present and future inventors judge fit to do in France or England, but, confiding in the perpetual advance of progress, I have every hope in the final result.

Pardon me, sir, if, carried away by a subject so worthy attention, I have passed the limits of a letter; I am the friend and representative of Lafon de Camarsac, and have therefore a double interest in the matter which I neither deny nor conceal. I however express my sincere conviction when I say that, although we may regret not knowing this secret, still we must thank and admire the artist whose perseverance and energy have created in photoceramic so important an auxiliary for photography.—Believe me, sir, yours truly, Camille Silvy.

38, *Porchester Terrace, W.*, 10*th December*, 1863.

Photographic Notes and Queries.

The Film repelling Solutions.

Sir,—I have read with much interest your article on the collodion film repelling the bath solution, having some time ago experienced much difficulty in that way, being nearly obliged to give up the use of my favourite collodion in consequence, for no other collodion troubled me in this way. On taking the plate from the bath, after a minute or so the solution would begin to withdraw from the upper edge of the plate as from a greasy surface, leaving the plate nearly dry; and where the solution ceased running, there it left a mark, spoiling another good negative. After trying many things, I tried reducing the strength of the bath; this I found to be a good remedy, without any apparent loss of sensitiveness; but as this would not do with a weak bath, I tried evaporating the bath for an hour or two. This I also found to answer well; so with these two remedies to have recourse to, I am no longer troubled with repellent films. Perhaps the above may be useful to some of your readers.—E. G.

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Talk in the Studio.

THE PERISCOPIC LENS.—Some fine large pictures by this new lens of Herr Steinheil were exhibited by Mr. Callaghan at the Photographic Society on Tuesday night. He stated that the data as to aperture, focus, exposure, &c., had as yet been only meagrely stated; but one point appeared to more than confirm our conjectures, recently expressed, as to the extremely small stops used, one of the pictures having been produced, it was stated, with a lens of 13¼ inches focus and 1-8th of an inch aperture, which is just 1-110th of the focal length. An aperture of 1-40th is really the smallest that any lens ought to require.

PHOTOGRAPHY AND ENGRAVING.—We understand that the likeness of her Majesty the Queen and her grandson, the Prince Albert Victor of Wales, in which her Majesty is represented in a sitting posture, with Albert Victor on her knee, engraved by Mr. M. Holl, is from the original taken by Mr. Jabez Hughes, of Ryde. Both the portraits are excellent, and the arrangement, which has been carefully followed by the engraver, is capital.

CAVALIERE NEGRETTI.—We have pleasure in announcing that Mr. H. Negretti, whose name is familiar to all our readers, has just received the honorable title of *Cavaliere* from Victor Emmanuel, in recognition of his labours in securing the release of Pelizzoni when under sentence of death for a murder committed by another person.

GELATINO-CHLORIDE OF SILVER.—Referring to our recent remarks on the use of gelatino-chloride of silver, as propounded by Mr. Palmer, Mr. W. H. Smith writes to inform us that the use of chloride of silver suspended in a solution of gelatine forms part of a patent for printing on canvas, wood, glass, &c., he has recently obtained, and which is about to be worked by a company. He has promised to show us specimens of the process, and we shall publish further details. How the gelatine is rendered insoluble is not yet stated.

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To Correspondents.

⁂ THE YEAR-BOOK OF PHOTOGRAPHY.—In a few days will be published our annual *résumé* of the progress of the art, in which we endeavour to epitomize the practice of photography, as endorsed by the ablest men. This year, in addition to condensed statements of the usual processes, with the latest improvements, and terse accounts of new processes, we shall have the pleasure of adding many original communications on practical matters of important current interest, from a large number of gentlemen, who have obtained recognition as amongst the ablest practical exponents of the art. The following list of contributors will best suggest the interest of the promised communications:—Dr. Diamond, F.S.A., Dr. Hill Norris, T. R. Williams, H. P. Robinson, James Mudd, O. G. Rejlander, Wm. England, Jabez Hughes, V. Blanchard, Russell Manners Gordon, S. Fry, the "Photographer's Assistant," W. B. Woodbury, W. Ackland, Nelson K. Cherrill, H. Cooper, Jun., A. Brothers, J. W. Swan, J. Burgess, and others.

W. C.—If sunning, or boiling down, and then adding a little nitric acid to your bath, do not remove the fog, it is better economy to make a new one. It is not well to filter the negative bath through the same funnel of paper as the printing bath, as the latter generally contains a good deal of organic matter, which would contaminate the negative bath. Sunning or boiling down to dryness would be the best remedy. 2. Add fresh iron solution to your old gelatino-developer. The latter should not be used old.

J. C. H.—In working the Wothlytype process, very much depends on the purity of the materials. Many commercial samples of the uranium salt are very impure and give bad results. Much depends on proper quality of collodion, and much on the paper, and, as a rule, a very dense negative with great contrast is desirable. With the formula you mention, and the materials we used, we produced excellent results. Our experience with the process is not sufficiently extended to enable us to judge from the appearance of the print as to the cause of the lack of vigour. It may be want of silver, or excess of free acid in the uranium salt, or unsuitable paper, or too thin collodion. The uranium has not been removed thoroughly by the acid bath, which causes the whites to be yellow.

ETHER.—The colouring matter of litmus is blue, and this blue is turned to red by the contact of acid, but is not sensibly affected by contact with an alkali. Red litmus paper is the blue litmus paper which has been submitted to the fumes of acid until it is red, in which state it turns blue again on being submitted to an alkali. 2. The gelatine printing bath will generally get a little discoloured if it stand in the light, and the more readily if too much gelatine be present. If it gelatinize when cold, there is too much gelatine present. 3. Ammonia is not usually added to a bath containing nitrate of soda.

ARTEMUS WARD.—It is probable that your bath is out of order, and that sunning, and strengthening, or boiling down, will prove it. With a case very similar to that you describe, we have found the addition of cyanide useful. The collodion you mention will be better for a few weeks' iodizing. The addition of a little more bromide to the collodion may aid you in getting more cleanliness.

A STAFF-SERGEANT.—Mr. Blanchard's dark box is such as you mention. The hands only, however, are inside, the head being kept out and the operations watched through a yellow glass window. (*b*) No legal action can be sustained for copying unregistered photographs, but it is unsafe, because you cannot tell what is registered and what is not; and it is not honourable. The engravings, &c., of the *Illustrated London News* and similar papers are copyright. (*c*) We shall be glad to see a description of the method, and also of the portable glass-house.

J. DUNK.—It is the opinion of some that developed prints are more permanent than sun prints, but is not quite certain. 2. An ordinary portrait-lens is used for enlarging from transparencies. 3. The mirror of a solar camera moves not on a pivot, but travels through the arc of a circle.

MISERABLE DAYS.—White calico is as good for blinds as anything. It is frequently desirable to have a double set, and then you may have white and dark blue.

GEORGE THOMPSON.—Copal is not soluble in alcohol, and only sparingly in essential oils. The mode in which copal varnish is made requires great care and skill. The copal is first melted by heat, and then linseed oil is added, which mixes with the melted copal. After that it may, we believe, be diluted with turpentine. In benzole and the hydro-carbons, a portion of copal is dissolved, and an insoluble spongy portion remains.

ABERDEEN.—Our experience is not sufficiently extensive to enable us to speak with certainty. We do not see any plan of applying the plumbago except by brushing on. Bi-chloride of platinum may be applied to the surface of the metal when perfectly clean, using 4 drachms bi-chloride of platinum in about 6 ounces of water. 2. The double sulphate of glycocine and ammonia will keep. There was nothing enclosed in your letter. We cannot tell why you get a lumpy deposit. You may use the ammonia-sulphate of iron if you wish, but it is unnecessary; you have already sulphate of ammonia in your solution.

A STUDENT OF THE NEWS.—Glue. 2. As a rule, a highly bromized collodion will keep well; we do not know the components of that you mention, and cannot therefore explain why it does not keep. 3. From your remarks we should suspect that it really contained very little bromide, as a highly bromized collodion very rarely solarizes. 4. The question whether *Saxe* or *Rive* paper is best is very much a matter of taste. A *Saxe* generally gives the most softness, a *Rive* paper the most brilliancy; and the latter is most liable to blisters. The question of super-albumenizing is quite a matter of taste. We do not like too much gloss. 5. The presence of the uranium salt is used to favour black tones. We do not think it necessary, and do not use it. 6. Take care to give sufficient exposure. 7. Opal pictures are best mounted in ormolu frames or cases; Mander's cupid case is very good for the purpose, permitting the pictures to be examined either by reflected or transmitted light. 8. Mr. Mayall's paper will appear in our next. 9. "Mr. Atkinson, Photographic Warehouse, Liverpool," is sufficient address. In each YEAR-BOOK we endeavour to give such subjects as have advanced during the year. We could add little to what we have given in former YEAR-BOOKS. No apology is necessary for either questions or suggestions.

NEMO.—We prefer No. 2.

H. T. L.—Mr. Carey Lea's original article on the gelatino-iron developer first appeared in the *Philadelphia Photographer* of June 1st. You will find it reproduced from that source at p. 328 of our present volume. The statement in a contemporary is inexact, but possibly not intentionally so. The most important modification is undoubtedly that of Mr. Cherrill, published in our pages, which consists in the preparation of glycocine separately, and adding it to the iron solution, thus rendering unnecessary the use of iron filings, &c. The process of "Clericus" consists in dissolving gelatine in Beaufoy's acetic acid; Mr. Hughes's formula is derived from this, but we refer always to Mr. Hughes's, because in his hands it was worked out; because it is one which we have tried and found good; and because we do not recommend Beaufoy's acetic acid, as it is a less definite article than glacial acetic acid. But, strictly speaking, these are not modifications of Mr. Lea's developer, having scarcely anything in common with it, although the idea was derived from him.

AN OLD SUBSCRIBER.—Spirit varnish applied without heat will dry dead, and without gloss or transparency.

A QUERIST.—We have described several modes of enamelling albumenized prints. You will find full details on pp. 447, 448, of our last volume. The process is too long to describe in this column. The prints are better enamelled before mounting.

RECEIVED.—"Dry-Plate Photography." By Professor Towler.

ERRATUM.—In the notices of "Registrations," in our last, the name of Mr. Gulliver, of Swansea, was spelt Gullire.

Several correspondents in our next.

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Photographs Registered during the past Week.

MR. ANDREW, Swansea,
Photograph of the Accident at Swansea Dock.
MR. E. HALL, New Malton, Yorkshire,
Photograph of Wesleyan Chapel, New Malton.
Portrait of Mary Taylor.
MR. W. H. MONNEY, Dublin,
Group of Managers of Irish Railways.
MR. CHAS. HALL, Leeds,
Portrait of Rev. A. J. Brameld.
MR. T. E. SEED, Weston-super-Mare,
Portrait of Rev. J. Fleming.

THE PHOTOGRAPHIC NEWS.

Vol. IX. No. 381.—*December* 22, 1865.

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PRINTING WITH GELATINO-CHLORIDE OF SILVER ON CANVAS, WOOD, GLASS, &c.

Some attention has recently been called to the possibility of employing chloride of silver suspended in gelatine, after the fashion of our collodio-chloride process, for printing purposes. We found many months ago that chloride of silver formed by double decomposition in a solution of gelatine remained in suspension, just as we had discovered it did in collodion; but in the limited trials we made of it in printing, from its tendency to solution in the processes of toning, fixing, and washing, we were not practically successful. Mr. Palmer, of Stonehouse, Devon, then announced that he had perfected a plan by which gelatino-chloride of silver could be successfully employed for printing on paper, glass, canvas, &c.; but he did not state the method by which the solubility of gelatine was overcome. We next received a communication from Mr. W. H. Smith, who stated that he had discovered and patented a method of printing with chloride of silver in gelatine. Since then we have seen the specification of the patent, and have been honoured with a visit from Mr. Smith, who also showed us a number of specimens.

We will first briefly state the process as given in the specification of the patent. The invention, it is stated, has for its object improvements in photography on wood, &c., and the preparation of wood, papier maché, china, earthenware, glass, canvas, silk, &c., for photography. These improvements consist in the application in succession of two distinct preparations. The first forms a *base* to fill up the pores of the wood, &c.; the second is called a *receptive*, and consists of a preparation sensitive to light. The base consists of gutta-percha, india-rubber, or valata, which is an elastic gum resembling india-rubber, dissolved in a hydrocarbon. The receptive consists of gelatino-chloride of silver, which is poured upon the prepared surface, dried and exposed under a negative, and then toned and fixed in the usual manner. Into the minutiæ of formula it is not necessary to enter here; these we shall detail in an early number.

It is, however, interesting to state that the results we have seen appear to be eminently satisfactory. The specimens brought under our attention were on wood and on opal glass, and we are informed that those on canvas are not less excellent. Mr. Smith informs us that his first experiments with chloride of silver suspended in gelatine commenced about two years ago, and were the result of an accident. The explanation which we have before sought as to the method by which the gelatine is rendered insoluble, still seems scarcely clear; but Mr. Smith stated his mode of working the method, and suggested, so far as he knew, the conditions upon which the insolubility was based. The solution of gelatine is in the first place suffered to become fluid by decomposition, and not by means of heat. In this state, although no longer capable of assuming the form of a jelly, it is still sufficiently viscous to hold the chloride of silver in suspension. When ready for use it has the consistency of a moderately thick collodion, is poured on the prepared surface, and in drying is subjected in an oven to a high degree of heat. The decomposed gelatine, when thus perfectly dessicated, assumes a condition in which it is but little affected by moisture, and requires a long application of very hot water, and considerable friction as well, in order to dissolve or remove it from the surface upon which it rests. The base, which on canvas consists of a mixture of plaster of Paris, gelatine, and oil, and on wood and glass, of valata, or other similar substance, Mr. Smith states, seems to absorb the sensitive preparation, which combines with it, and thus helps to hold the gelatine film and protect it from any solvent action.

The prints on wood which we saw were varnished, but they had the appearance of being quite sunken into the surface of the material, the pictures being, notwithstanding this, vigorous, rich in tone, and having the general appearance of good silver prints produced in the ordinary manner. The examples on opal glass were rich and vigorous, differing little in appearance from prints on opal glass by the collodio-chloride process.

Mr. Smith has not yet tried the gelatino-chloride upon paper, his chief attention hitherto having been given to its application on wood and canvas, for which purposes the process appears to possess the most commercial importance. In a photographic aspect, the matter is interesting, as distinctly indicating new possibilities. As we have said, we shall return to the subject and state the process in more detail shortly; in the meantime it may be interesting to experimentalists to know that the proportions of silver and chloride used are those which we have practically found best in collodio-chloride printing, the chloride bearing the relation of one to five of the nitrate. Mr. Smith uses 5 grains of chloride of cadmium, and 10 grains of nitrate of silver in each ounce of gelatine solution.

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THE PHOTOGRAPHIC SOCIETY SCANDAL.

On Tuesday evening last a meagrely attended special meeting was held of the London Photographic Society, in accordance with a resolution announced in our last, to take into consideration certain unjustifiable statements made in the *British Journal*, by Major Russell and Mr. G. Dawson, personal to Mr. Glaisher, one of the vice-presidents. The subject in question was stated in our columns in June last, and it is unnecessary now to revive the matter. After Mr. Glaisher had read a portion of the correspondence containing the misstatements, a disposition to effect a compromise was manifested by some of the members; the issue of which was, that Mr. Dawson withdrew his statements and apologized to Mr. Glaisher. This retractation and apology having been accepted, after some further discussion, a resolution requesting Major Russell and Mr. Dawson to withdraw their resignations was passed,* and Mr. Dawson on his own part withdrew his resignation. Whether the retractation and apology made extended to the other gentleman concerned the proceedings did not clearly show. Until this is placed beyond a doubt, it appears to us that a hollow truce, not a permanent peace, is effected. Major Russell was not present, but Mr. Glaisher read an extract from a letter from him, admitting some error in his former statements.

ON THE CONSTRUCTION OF A PHOTOGRAPHIC GLASS ROOM.

BY J. E. MAYALL, ESQ.†

Numerous articles have been written on this subject with more or less ability, but it is no disrespect to any one to say that our knowledge of the best construction of a glass room is still empirical; that is, no principle has been established which applies to all glass rooms, whereby the following important results can be obtained:—

1st. The light to be under control in winter and summer,—to add on to the deficiency of the one; to subtract from the redundancy of the other.

2nd. To be able to concentrate the light on the most important points of the figure; to blend and soften off into positive shadow the less important parts.

3rd. To render age less garrulous; make beauty more lovely; to impart an expression of intelligence where nature has not been over bountiful; to light up the intellect, and to impart the quality of power, in those heads on which she has lavished her most precious gifts: in short, to be able to present human nature in its best form, by the aid of a camera and a properly lighted room.

This seems a rather formidable list; and I am not unmindful that there are persons, otherwise well-informed, who sneer at the photographer as a presumptuous creature for venturing to tread on the domain of art. His best efforts are unblushingly appropriated without acknowledgment. If every stolen idea from the photographer could cry out "stop thief," an army of policemen would be necessary to take into custody the delinquents, that gleam and shine in the light of day, from the walls of every public exhibition of paintings, not only in our own country, but in every other where art is really advancing, and honest truth has taken possession of public taste. The gander necks, the long chins, the saucer eyes, brow like the rainbow, and mouths like that of a cherub on the tombstone of a country churchyard, with which our forefathers of the last generation were ignorantly contented, won't do now. Oh, no! all this has changed; every well-filled photographic album is a silent monitor, not only what to do, but what to avoid doing, and above all *what to dare to do* with the wondrous perspective which the perfect optical instruments of the present day have placed at the disposal of the intelligent photographer.

The solar camera is coming down on art like an avalanche; its power, its beauty, its delicacy, all combine to sweep away cobweb inefficiency. A badly drawn portrait, that might be like the original, or accidentally like anyone else, will soon be a thing of the past. All true artists will hail with delight this harbinger of truth, this real living presentiment of a man, instead of the conventional suit of clothes with which the Moses and Sons of art have hitherto contrived to dress up the minds, as well as the bodies, of their afflicted and much injured patrons.

This theme is capable of extension; but I leave it in your hands, and at once proceed to the immediate business of this paper, on the construction of a glass room, which I hope may contribute to greater perfection in things photographic.

Example:—

If I suspend a silvered ball in the centre of a square room and open a window to the left hand, the light impinging on the ball will radiate from a central pencil, and gradually but imperceptibly faint away past the apparent edges into obscurity. A sense of roundness is imparted to the optic nerve, and a very clear and well-defined image of the ball is produced.

Now if I open another window in front of the ball and allow a second light to impinge on the surface of the ball, another pencil of light will be formed opposite this second window; portions of the ball which were in the first instance in positive shadow will now be illuminated, and the lights from the two windows will cross each other, and a confusion of shape will be produced on the optic nerve—an effect of elongation will be produced on the side of the ball next to the left-hand window.

Suppose I open another window on the right-hand side of the room: a third light will illuminate the ball, producing still greater confusion of form, bulging out the ball at the right hand as well as on the left, producing the sensation on the optic nerve of an oblate spheroid, giving false form, enfeebling my first impression, and destroying all unity of shadow, which for the sake of correctness is as important as the high light,—in short, producing an apparent prominence on the ball where there is really nothing of the kind.

Again, I erect a pole in the sunshine that casts a certain shadow on the ground. At a distance from the sun, say of 20°, an imaginary sun casts another shadow of the same pole. Neither of these shadows in the presence of the other will be so well formed—that is, so definite; each will appear abraded on the edges, and enfeebled by the presence of the other—the source of light in the one case tending to enfeeble the image of the other, and both combining to produce confusion of image on the optic nerve, the two sources of light being positively injurious to correct form.

Now, if we substitute the human figure in each of those cases, whatever happens to the ball and the pole in the matter of lighting happens to it under the given conditions. What conclusion ought I to come to, then, in regard to lighting? If two or more sources of light produce false effect, false form—protuberances where none exists in nature—unlikeness instead of likeness—feebleness of shadow—indefiniteness of shape—surely I ought to consider whether these false impressions cannot be removed by adopting *one source of light* in the construction of a portrait room, and avoiding all opposing lights as utterly destructive of success, whether they be direct or reflected. *One source of light*, and one only, is the principle I venture to submit for your consideration—either with a high side light, which then becomes top and side, or else with the two combined in the same direction, never opposing.

Why is it so many photographic portraits are not likenesses? Because the principal light, which if left alone would make the portrait, is interfered with by reflection or opposing direction—false lights making prominences in the face where none exist in nature, or intensifying them where they do exist. I put out of the question here considered the ridiculous twaddle that is uttered by half-educated opticians, that prominences are magnified by the camera. In the infancy of our art this might have been the case—in the days of spectacle-lenses, and cigar-box cameras, and ignorance to direct them. But such men as Dallmeyer, Voigtlander, and Ross have done away with this incubus of the early photographer. These men have so balanced the curves of their lenses as to distribute the aberration equally over the field of view of the camera, and rendered distortion impossible within certain limits; and no intelligent operator would strain his lens to attempt to cover a larger field of view than that for which the lens was constructed. Photographers owe these able men a debt of gratitude for their splendid exertions; and while doing justice to them I am not unmindful that Petzval, l'Abbé Moigno, Foucault and Grubb, have each worked in the theoretical branch, and the two latter in the practical also, towards the same end.

Now, supposing I have made myself intelligible in the enunciation of the principle of *one source of light*, a glass room will grow out of a principle, and its form will be determined by the thing it has to do—that is, to produce perfect lighting of the figure, without distortion, confusion, or indecision. That it ought to have no more glass than is necessary to this end, I think will be evident to anyone capable of forming an opinion. An elongated glass room, all of glass, is really two sources of light—to say nothing of the heat and of the confusion to the camera-lens itself. This brings me to the point to project a glass house on the screen, from the principles here enunciated, guided by the experience of failure as well as of success.

Let XXX be a section of your room; A the head of the sitter;

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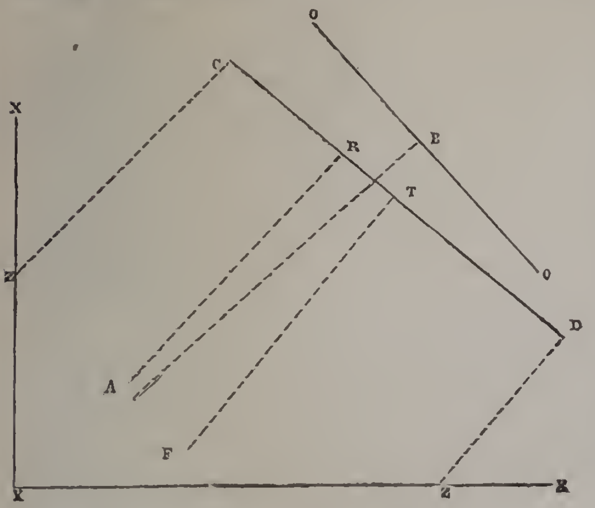
* Since the above was in type we have received several letters pointing out that this resolution was illegal and invalid.

† Read before the London Photographic Society, Nov. 14th.

a line AB, to bisect another at B at right angles to BA, will give you the pitch of the roof OO. For perfect illumination of the figure, I assume that the opening at B will be 7 feet on each side, or 14 feet altogether, which I find by experience about the best dimensions.



Now if the pitch of your roof be made flatter (CD), what part of your figure will be best illuminated?

Bisect your opening CD, and drop a perpendicular from T, which strikes the figure at F; F is therefore the centre of illumination of the figure, and parallel lines from C and D to meet XXX embrace the area of illumination of the room CZ, DZ; but as this embraces too much foreground and too little background, it would be necessary to alter the centre T to a fresh point R, so that the head shall be the centre of illumination. From this it clearly follows that the flatter the roof the more headroom will be required to preserve the centre of illumination on the head of the figure.

Now OO is at an angle of 45°, CD at an angle of 35°; therefore I conclude that from 35° to 45° is the best angle for the roof.

I lay it down as an axiom, high side-light for illumination of the subject, and controllable soft broken top-light to make the shadows—both combined, but in the same direction: no reflectors of any kind; these oppose the action of the principal light, and tend to enfeeble the likeness. In a short sentence, the *lighting* and the *shadowing* to come both from the same one *source of light*, blended, mixed, and broken in the same direction—not opposing, as all reflected lights do and ever will.

This brings me to the subject of blinds. I have tried various ones, M'Lachlan's included. I find light tissue paper of a blue colour very good to filter the sunlight through in summer, but too opaque in winter; muslin blinds of a grey tint are good, if made of two thicknesses and to slide over each other when the light is strong.

M'Lachlan's blinds were so badly made that they never had a fair chance in my hands. For breaking up the sunlight and massing it in its proper direction they are good, and, if simply mounted, very desirable, as they can be drawn up in winter out of the way when the sun does not shine. I now speak of them for top blinds for producing shadow, as I do not admit that the high lights can be produced with blinds at all. The side opening must be clear and of 14 feet, with blinds both white and black, to close, to open, or to modify the amount of light.

A painter's eye is necessary to judge of the various effects to be produced by different modifications of the quantity of light; but one thing must be borne in mind—that the scale of lighting must be higher than that which a painter would use, or else the resulting portrait will be dark in the shadows and with no brilliancy in the high lights.

According to my experience, the room ought to be 24 feet in length, a blank side wall from the background of 6 feet, then an open window 9 feet in width, by 12 or 14 feet in height; the width of the room 14 to 16 feet. The portion of the room in which the camera stands ought to be obscure; if in darkness, all the better, to prevent stray light impinging on the plate. For the side-lights I recommend plate glass; for the top I am inclined to adopt this new light-coloured ribbed glass, which I think will dispense with blinds altogether.

The best aspect of a glass room is either north-east or south-west. I believe it will be found that north-east is better than any other, as the light is so steady and not so difficult to manage.

I have purposely made this paper short, that it might afford time for discussion; and I hope the members will endeavour to grasp the principle I have endeavoured, however feebly, to enunciate, and that by combining our experience a better method of treating the light may ensue, and consequently greater perfection in the productions of our art.

At the conclusion of the paper a discussion took place, of which we give an abstract:—

Mr. ALLEN, whilst he agreed that in taking the human figure it was desirable that the principal light should come in one direction, thought that diffused light was very valuable, and a large glass house which would assimilate the effect to that of the open air would be best.

Mr. HUGHES said, the main idea enunciated, that it was desirable to have one principal broad light illuminating the sitter, was so true that it might almost be considered axiomatic, although in practice it was too frequently forgotten, or, for the sake of economy, was obliged to be disregarded. Still it was a principle, true in art and in every application of it, that there should be one dominant light giving form and shape to everything illuminated. In illustration of the fact, it was only necessary to throw two lights from opposite directions upon any given object, when it would be found that the apparent shape of that object was entirely altered. The example which had been already given of the effect of the arrangement of light upon a spherical body was a very familiar one, and it admirably illustrated the correctness of this position. A round ball, by a proper arrangement of light, could be so illuminated as to convey to the mind as real an impression of rotundity as though the ball were being held in the fingers. And so was it with the roundness of the head, the squareness of the cube, and the special form of any other object. Let two persons illuminate the same sphere, and mark the difference of result. One would so balance his lights that in the photographic representation it would appear literally to stand out in relief; whereas the other would so disarrange or derange his lights that, instead of the semblance of a sphere, it would be flat like a plate or disk. The last speaker, he thought, had somewhat misunderstood Mr. Mayall's remarks upon the influence of diffused light, and supposed that he had spoken of it as desirable. The undesirableness of general diffused light in photography was manifest in that greatest of glass houses, the Crystal Palace, where the light fell on the sitter, not in one but in every direction, and the consequence was a haziness which was in the highest degree unsatisfactory. His advice, therefore, would be not to have more glass in the house than they could possibly help—to make the most of their local conditions, which, generally speaking, were the governing ones—and to secure as far as practicable one dominant light, all the others being secondary or subordinate.

Mr. ALLEN did not wish to convey the idea that he thought a large room full of diffused light was desirable, and that therefore it would be well to have glass all round. But he did think that the light which came from illuminated air tended to soften the shadows.

Mr. FRY said there was one point upon which he should be glad to hear the experience of some gentlemen present. With regard to having the camera in a dark or light place there was some little diversity of opinion among photographers. He had had occasion recently to build a glass room, and he had adopted the plan with the glass slanting down from the front, and a dark part from that. It was found that, with reference to the first portion of the plan, it was a mistake, and it had to be altered; but he had still preserved the dark passage in which the camera stood.

Mr. COLE, referring to the use of ribbed glass, said he should imagine there would be a danger in employing it, from the refraction of light. He had with him what he considered a beautiful specimen of glass which would be very suitable for photographic rooms, as it enabled them to get a more equally diffused light than by employing ribbed glass. Ground glass, he thought, was detestable.

Mr. BUCHANAN SMITH did not agree with Mr. Mayall that the absence of reflection was necessary or advantageous. He thought it was absolutely necessary, in order to produce roundness of effect, that they should have light, shade, and reflection.

Mr. SEBASTIAN DAVIS thought it was not necessary that the light should pass directly through the glass at an angle of 45°, nor that it should be made to fall upon the sitter at that angle, although it might be desirable as being the average medium.

Mr. MAYALL said his glass for illuminating the figure was his high side light; the top light, which was broken up and massed, but always in the same direction as the principal light, was used to illuminate the shadows instead of reflected light. He maintained that they would produce a much finer effect with a direct light coming in the same direction as the principal light, with which the sitter was illuminated, than with reflected light.

A NEW PHOTO-RELIEF PRINTING PROCESS.

BY WALTER WOODBURY.[*]

The new process which I have the honour of bringing before your notice this evening is the result of some fifteen months' close experiments, as during that time I have devoted myself exclusively to the perfection of what seemed to me to be a great want in photography,—a process which should secure permanence, cheapness, and expedition in working. I shall not trouble you with many details as to the *modus operandi*, as they have already been fully published in the photographic papers; and you will be better able to judge of the process by seeing it in operation.

I will first endeavour to illustrate the principle on which this method of printing is based. On the table is a small bath composed of two pieces of plate glass arranged in a V-shape, meeting at the bottom, and opening out at the top to the space of about 1-inch; this is filled with a solution of gelatine and colour, and illustrates fully the principle involved. The broadest part, containing a thick layer of material, produces a black, and as it gets thinner towards the bottom gradually merges into white. Now by having a metal intaglio mould in which the dark parts of a photograph are represented by a deep hollow, the middle tints by hollows half the depth, and so on until we come to the highest surface of the mould which represents the whites of the photograph—then filling this mould with a mixture of coloured gelatine—and, for the purpose of immediate illustration, with coloured water—we make at once a photograph in water, the shades being where the layer of water is deepest, and so gradually getting thinner till we come to the white parts. By adding a little gelatine to this coloured water we are able to preserve this shape, and detach it from the mould, owing to the setting properties of the gelatine. By laying a sheet of paper or glass on the mould, and squeezing out all superfluous matter, the gelatine, on setting, adheres to the paper, and can be lifted from the mould. This constitutes the principle on which the whole is based. The metal mould is obtained by pressure from a gelatine relief which is produced by the action of parallel rays of light on a sheet of gelatine and bichromate, and then washing away all soluble parts, leaving a *cliché* in different degrees of relief, according as the light has been allowed to act on the gelatine to a greater or less depth. This mould, when dry, is placed in a hydraulic press in contact with the metal, and an exact reverse is by this means obtained, but in a more solid material. I laboured long to produce these moulds by the electrotype process, but found it too uncertain for any practical use. Having obtained this mould, the remainder of the process will be better shown by illustration, which is my chief purpose this evening.

It would be of little use my alluding to the number of applications that this process is capable of, as they will naturally suggest themselves to you all: some few are on the table for your inspection this evening.

HISTORICAL NOTES ON PHOTOGRAPHY IN NATURAL COLOURS.

BY J. TRAIL TAYLOR.[†]

The dulness of the present season, together with my desire to make this paper a purely historical one, prevents me from alluding to any experiments which I have myself made. These I hope to bring before you when the bright summer weather (for bright weather is absolutely indispensable for heliochromic operations) will enable me to do so in a more effective manner than would at present be possible, and to illustrate any further remarks by showing experimentally the most successful and simple methods of preparing the plates. It was my desire to have exhibited this evening some of the specimens of Becquerel and Niepce. The latter-named gentleman is at the present moment absent from Paris in attendance upon the Emperor, and will not return until some days after this meeting; the former would gladly have sent me some specimens, but his generosity to his friends has left him at present without a single picture. The pleasure of an examination of the heliochromic works of these *savants* is consequently reserved for another occasion.

Heliochromy is the appropriate name which has been assumed for photographs produced in natural colours. Photography could scarcely be said to have advanced far in juvenescence ere some of its votaries seemed to have reasoned thus:—"There is colour as well as form in nature, and, seeing that photographs can reproduce the latter even in its most delicate and minute shades, is there any reason existing why the hues of nature cannot also be produced?

I said at our last meeting that I thought the subject of heliochromy had not been yet brought before the notice of any society in London. I find, however, that in 1853 the subject was alluded to at a meeting of the London Photographic Society, and I allude to that circumstance for the twofold purpose of showing that the sceptism which prevails at the present time relative to the *possibility* of producing natural colours also prevailed then; and also to show what progress had been attained. Mr. Malone had been making some remarks when he was interrupted by Sir W. Newton, who said:—

> You do not mean to say that a natural colour has been produced?
>
> Mr. Malone: Yes, sir, an actual colour produced, and the colours existing in that half of the spectrum which gives the yellow ray on the first to be produced, so that had Becquerel's experiments taken place prior to Daguerre's, we should probably have called that the photogenic end of the spectrum. The colours produced are evanescent if exposed to the action of the white light of daylight, but they could be preserved for some time in the dark, and could be shown occasionally in diffused light.
>
> Mr. Hunt: Becquerel and Niepce have most decidedly produced all the colours of the prismatic spectrum, ray for ray as they are coloured in nature. They have copied highly-coloured pictures, producing colour for colour as upon the painting. They have not succeeded yet in fixing these colours, but Niepce has advanced considerably towards it by the use of ammonia.

From this it is apparent that, twelve years ago, photographs were produced in natural colours, but that no means of fixing them were then known. The question will now present itself: Have we advanced from that position? and if so, to what extent and by what means?

At a *conversazione* of the Social Science Association in Edinburgh, in 1863, at which Prince Alfred, Lord Brougham and the *élite* of the many notables at that time in Edinburgh were present, I was entrusted by Sir David Brewster with, and exhibited on behalf of the Edinburgh Photographic Society, which provided the principal features of attraction on the occasion referred to, a miniature case containing a photograph in natural colours. The subject was the spectrum—in my opinion the most fitting for showing heliochromic illustrations—taken on a polished metallic plate. The unimpressed margin was of a red colour, and the colours of the spectrum were most decided, although they certainly could not be designated as brilliant in their character. I had this picture in my possession for a fortnight, during which time it was freely exposed to the light of the sun. Sir David Brewster, too, assured me that the colours had undergone no change since the picture had come into his possession, although it had been freely exposed to the light. Photographs, then, which show the natural colours to some extent have been produced at will, and have also been fixed.

It is unfortunate that so few have experimented in this direction. Among the thousands of scientific experimentalists which photography boasts of, the number of those who have devoted time and attention to this branch is, I much fear, under half a dozen. When the number of these is increased, then will the probabilities, possibilities, and capabilities of heliochromy be more fully developed.

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[*] Read before the Photographic Society on the evening of December 5th.

[†] Read before the South London Photographic Society, December 14th.

I have been requested to make the present paper a historical record of what has been done in the production of pictures in natural colours. In order to do this I must single out the two or three who have investigated the subject, and give an account of what they have effected.

Becquerel.—In the *Comptes Rendus* of February 12, 1849, there is a report by MM. Chevreul and Regnault, on Becquerel's memoir on the subject before us. It commences by stating that M. Becquerel had recently succeeded in impressing on a Daguerreotype plate all the colours of the solar spectrum, and to a certain extent those of coloured drawings and natural bodies. Previously he had observed that red rays, which exercised almost no action upon sensitive paper prepared in the dark, acted much more rapidly upon the same paper after it had been exposed to light, and that, while the paper in the first of these states gave only a brown or slightly violet colour in the refrangible rays, paper in the second state, or after the exposure to light, gave variable colours, recalling those of the rays which produced them, and even developed those colours in the less refracted parts of the spectrum. Pursuing the subject he was led to the following method of preparing the plates for receiving coloured impressions. After polishing the plate he fixed it on a small support of wire, which held it by means of two hooks. The two wires are connected at the upper end, which is put in communication with the positive pole of a galvanic battery. The plate is then immersed in a large vessel containing about fifteen pints of hydrochloric acid diluted with water. Into the same vessel is plunged a strip of platinum which communicates with the negative pole, and this is moved rapidly backwards and forwards parallel to the surface of the plate and a certain distance from it. The plate of silver takes successively the colours of thin plates, which may be readily seen when the room is feebly illuminated. The colour commences with grey, then come the yellow and violet tints; it then passes to blue and green, then to whitish-grey, rose, violet, and, lastly, blue. At this violet stage the plate must be removed, plunged in distilled water, dried by slightly inclining it, and heating it gently by means of a spirit lamp, and blowing on its surface. An immersion of one minute suffices to produce this colour. Plates so prepared will keep for a long time in the dark. When about to be used, rub the surface well with a soft pledget of cotton. When a spectrum is projected on such a plate the orange and red rays first act and develop a red colour, which rapidly increases in intensity. The green ray produces a green colour, and so with the blue and the violet, which are very fine and intense. The yellow is impressed with difficulty, but is distinctly seen.

If a plate so prepared be heated before exposure, it acquires new properties. It assumes by the heat a reddish tint, which, which is the state most suitable for receiving all the colours. The yellow and green, blue and yellow, take good colours; so with the orange and red, which latter two give tints more violet than those of the spectrum.

An exposure of one or two minutes is sufficient to impress a bright and concentrated spectrum. Copies of coloured prints may also be obtained on these plates, but the colours are feebler than those of the spectrum. In the camera a long exposure is required to obtain intense pictures. These may be preserved in the dark, but eventually disappear under the action of diffused light.

M. Becquerel subsequently found that, instead of heating the plates, exposure to the light of the sun, under a sheet of paper impregnated with sulphate of quinine, produced in an exalted degree the peculiar properties conferred by the heating. the heating.

Niepce de St. Victor.—It is generally conceded that the colours obtained by this gentleman have much exceeded in brilliancy those of Bequerel. He started on the known basis that a plate of silver immersed in a solution of sulphate of copper and chloride of sodium, at the same time rendered magnetic by means of a battery, is chloridized, and becomes susceptible of receiving colour when it is exposed to light. His observations having led him to think that it was possible there might be some relation between the colour which a body communicated to a flame and the colour which light develops on a plate of silver which had been chloridized with the body which colours that flame, he undertook a series of experiments, which he submitted to the Academy of Sciences. The bath in which he immersed the plate was formed of water saturated with chlorine, to which he added a chloride endowed with the property of colouring flame with the colour which he wished reproduced on the plate; for example, chloride of strontium (which gives a purple colour to flames in general, and to that of alcohol in particular), when used for preparing a plate of silver, would cause the red and purple tints to be strongly impressed.

When it is desired to reproduce the other colours of the spectrum, the same method must be employed as that followed in the case of the red ray, by employing the chlorides of calcium and uranium for orange, and hypochlorite of soda or the chloride of sodium or potassium, as also pure solution of chlorine, for yellow. Beautiful yellows have also been obtained with a bath composed of water acidulated with hydrochloric acid and a salt of copper. Greens are obtained by means of boracic acid and chloride of nickel, as well as by all the salts of copper. Blue is obtained by the employment of the double chloride of copper and ammonia; indigo by the same substance; and violet by the chloride of strontium and sulphate of copper. If the plate of silver be prepared with water acidulated with hydrochloric acid, all the colours are obtained by the action of light, but the ground is always black, and this preparation of the plate can be made only by means of the battery. M. Niepce has reproduced all the colours of a model by preparing the plate with a bath composed of deutochloride of copper. He says:—

"If a bath be formed composed of all the substances which, taken separately, give a dominant colour, very vivid colours will be obtained; but the great difficulty is to mix them in suitable proportions, as it almost always happens that some colours are excluded by the others. The production of all the colours is possible, but not without properly preparing the plate. I have begun by reproducing in the camera coloured engravings, then artificial and natural flowers, and, lastly, dead nature. In a doll dressed in stuffs of different colours, and trimmed with gold and silver lace, I have obtained all the colours; and what is still more extraordinary and more curious is, that the gold and silver are depicted with their metallic lustre, and that rock crystal, alabaster, and porcelain are represented with the lustre which is natural to them. The greatest difficulty is that of obtaining many colours at the same time on the same plate. It is, however, possible, and I have frequently obtained this result. I have observed that bright colours are reproduced much more vividly and much quicker than dark ones—that is to say, the nearer the colours approach to white the more rapidly are they reproduced."

A beautiful image of M. Niepce's doll with its gorgeous drapery was obtained by immersing the plate in a solution of hypochlorite of sodium, having a specific gravity of 1·35, until it assumed a bright pinkish hue. The plate was then covered with a solution of dextrine saturated with chloride of lead, then dried, and subsequently submitted to the action of heat, or to light under sulphate of quinine. It was then ready for exposure in the camera.

A curious fact in connection with this process is that the binary colours of the spectrum (orange, violet, and green) can be reproduced if those colours are natural, but if they are artificially produced by the mixing of two of the primary colours they cannot be reproduced, but only one of the two colours employed in their preparation. Mr.

Thompson, of Edinburgh (to whose researches I am indebted for many of these particulars), states that Mr. Hudson, of Blackford, produces colours in the following easy manner:—Make a bath of water 2 ounces, hydrochloride acid 4 drops, saturated solution of common salt 4 drops; filter; plunge the plate into this quickly; allow it to remain five minutes, when it will have become dark on the surface; wash well in water and heat over a lamp until it assume a red colour. This plate copies all the colours.

I shall conclude by appending a remark or two concerning the colouration of paper. If paper be washed with nitrate of silver and then with fluate of soda, a spectrum shows the yellow, green, and blue in a decided form. If oxide of silver be dissolved in a solution of nitrate of ammonia (ammonio-nitrate of silver), a paper prepared with this will show colours. By a solution of chloride of barium and nitrate of silver the colours are shown distinctly, and a previous wash of iodine increases the sensitiveness, although the colours are then of an erratic character. We owe much to Herschel and Hunt in connection with the subject of heliochromy on paper, but time will not at present admit of any detailed notice of their researches.

ON A NEW ECONOMICAL FILTERING APPARATUS.

BY J. F. W. HART.*

The subject of my paper to you was intended, as announced, for our previous meeting; but owing to the deep and well-deserved interest bestowed on Mr. Blanchard's lengthy address, I felt it would be a dishonour to risk alienating your thoughts for one moment from so momentous a subject.

To proceed: we have before us, I think you will say, a new arrangement for facilitating the clearing and filtering your various solutions with the least possible expenditure of time and material. It may be well to tell you what induced me to form this arrangement. Many photographers have remarked to me that they pour off their solutions from the sediment to save the waste from absorption in the filtering papers, and I may add, in non-chemical students' hands many valuable drops are lost down the outside of the vessel from which it is poured, as the filter is occasionally filled up. I do not look on the principle of pouring off in the subdued light of the sensitizing room as a safe plan, even were we all practised manipulators in chemistry. I now take the opportunity to thank our worthy secretary for having finally induced me to bring about what, I hope, will be found an improvement on the old method.

On the completion of my first model for the above purpose, I saw it could be used perhaps with great advantage in the arts and manufactures, more especially in the preparations of pharmaceutical products, as it was not only a filtering apparatus, but an efficient percolater, doing its work without exposure to the external air; thus it could be employed for the preparation of all volatile tinctures and aqueous extracts at whatever temperature and pressure the operator might desire. At this stage several friends, seeing novelty in the arrangement for the above purposes, asked me, did I not intend to protect the combination by a patent? I think it better in the present unsatisfactory state of our patent laws to virtually repeal them, trusting to the honour of the trade and the appreciation of the public. I will now show you the comparative action of my economic filter and percolater by the side of the old method. I place the dish for floating by its side, and simply blow through this movable tube in the funnel, and you see the action commences, and the clear solution is flowing quickly from the turbid one in the apparatus. On looking at the graduations on the side of the vessel we see how many ounces are run off, and stop it by the volumetric clamp when sufficient. We will now suppose an interval has occurred in which as much paper as desired has been floated. We remove the pressure tube and stopper from the funnel, and pour our solution direct into the apparatus, replace the stopper, tube, and cover, give a shake round, and it will be ready at any future time. I have not had the opportunity to practically test it for the negative bath; but it is thought photographers in out-door work will find it of great service, as no filtering papers or separate funnels would be needed.

To illustrate the use of the apparatus in a practical manner in an apartment not fitted up as a sensitizing room would be. I have constructed this case, the upright support carrying the top rod for the wet sheets as they come from the bath, and drip into the lower tray, which carries the solution into the apparatus without waste. When the top rod is filled, the driest piece is placed under the tray; by the time this is filled, the first piece will be dry enough to be placed in the case; thus it answers a double purpose, a support for the paper while drying, and a receptacle for it after. The pieces all pack inside. If this drying case and support is not useful to our professional members, probably it may be to some amateurs.

"A FEW NOTES ON GELATINE IN THE PRINTING BATH."

BY H. COOPER JUNIOR.*

The star of gelatine seems now, more than ever, to be in the ascendant, as it takes a place of paramount importance in the four processes which are at present occupying the attention of photographers, viz., Mr. Woodbury's photo-relievo printing, the organic developer, Mr. Swan's carbon process, and Mr. Palmer's organic printing bath.

Experiments with the gelatino-iron developer have naturally created a desire to see the effect of similar organic bodies used in other photographic processes. From the developer to the printing bath is not a very long step, so that whilst discussing the merits of gelatine in the one, we also attend to what is said of the advantages of it in the other. Unfortunately, I have not as yet been able to make many experiments with Mr. Palmer's gelatino-silver bath; but whilst thinking the matter over, an idea has occurred to me which I thought might be as well jotted down, so that if there be anything in it, those who have opportunity may work it out. It is the addition of a salt of glycocine to the printing bath in place of part or the whole of the plain gelatine added. It appears to me evident that when gelatine is dissolved in a solution of nitrate of silver, some decomposition takes place. Of course in preparing sugar of gelatine to add to the silver bath it would not do to employ sulphuric acid. This difficulty is soon got over, as it is well known that nitric acid also possesses the power of forming sugar of gelatine, or glycocine, from gelatine.

Salts of glycocine combine to form crystalline compounds with oxides or salts of the metals; it may therefore be hoped that we can form a useful and really chemical compound of nitrate of glycocine and nitrate of silver. The most scientific and complete way of accomplishing this would most likely be to act upon the gelatine with nitric acid and water, and then to saturate the nitric acid with metallic silver. This method would be an exact prototype of Carey Lea's mode of preparing his developer nitric acid and silver being substituted for sulphuric acid and iron. The method I have mentioned would necessarily involve some trouble, so the following might be adopted; and I have hopes that the *practical* effect would be nearly the same:—Decompose the gelatine with nitric acid, and then neutralize the latter with an alkali, soda, potash, or ammonia.

A proper proportion of this compound is then to be added to the silver solution. I ought to mention that the first method I have proposed to form an organic silver salt is not nearly so difficult to carry out successfully as Carey Lea's formula for his developer, the action of nitric acid upon metallic silver giving less trouble than the action of sulphuric upon iron. The making nitrate of silver is a comparatively easy affair, which can be successfully accomplished by those who have not had much practice in chemical manipulations.

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* Read before the South London Photographic Society, Thursday, December 14, 1865.

* Read before the South London Photographic Society, December 14th, 1865

The question now arises as to the probable action of a salt of glycocine in the printing bath.

I have very little doubt that it would be found to confer greater brilliancy on the print. But would the paper be more or less sensitive to light than when prepared with an ordinary bath?

This can only be satisfactorily decided by actual trial; but there are two facts which may be mentioned, and which in a great degree seem to contradict each other—1st. In depositing a metal from a solution of one of its salts, either by substitutions or by means of a galvanic current, as in electrotyping, plating and gilding, the addition of gelatine, or the sugar of gelatine, retards the reduction of the metal, and at the same time confers upon it greater continuity. The metal is reduced in very small particles, and in a particularly even manner.

A simple experiment, which very successfully illustrates the action of gelatine on the deposition of a metal, is thus made. Make an aqueous solution of sulphate of copper. Take a bright steel knife and plunge it into the solution. It will immediately be coated with a bright film of metallic copper which is easily wiped away. Now add to the copper solution some of the organic solution containing glycocine, the same as used for the organic developer. Then again plunge a bright steel blade into the solution. It is now, as in the first instance, coated with copper; but notice how differently. In the former case the bright film of copper was deposited instantaneously; now it is deposited very slowly, and instead of being bright is dull-looking. After washing the blade with a little water to remove the solution clinging to it, the deposited copper may be polished without removing it from the steel. The addition of gelatine has given the metallic film great adhering power. This simple experiment illustrates the difference made by gelatine where a metal is precipitated by substitution. The sulphuric acid united with the copper leaves it and combines with the iron, thus setting the metallic copper at liberty.

If we wish to observe the difference made when using a galvanic current, we must take a piece of copper (an *old* penny-piece answers well) and attach it to the negative wire of a galvanic battery. This is immersed in the solution of sulphate of copper, which, for this experiment, should be rather strong. To the positive wire of the battery we affix a tablet of wax; and then brush the surface of the wax with fine plumbago, taking care that it extends to where the wire from the battery enters the wax, in order to render the surface a conducting one. For the first trial we use a plain solution of sulphate of copper; for the second we add some of the organic solution. We immerse the tablet of wax in the solution, taking care that it does not touch the piece of copper already there, and watch the deposition of the metal. In making this experiment, so many little things have to be attended to—such as having the same quantity of sulphate of copper in an ounce of the solution, and making the electric current of the proper strength—that a *reliable* result cannot be well obtained by those who are not somewhat acquainted with electro-metallurgic operations.

We derive from these experiments the supposition that paper sensitized on a silver bath containing a salt of glycocine, or even gelatine itself, would be *less* sensitive to light than one prepared in the ordinary way.

2nd. I will briefly relate the first experiments I made with the organic silver bath, which will bring out the other fact, which points to an opposite supposition, and to which I wish to direct your attention. I dissolved 1,200 grains of nitrate of silver in 50 ounces of water, and added two drachms of strong liquor ammonia. This was filtered into a glass flask, and 1 ounce of gelatine, previously soaked in water, was added. I then placed it over a spirit lamp to slightly warm it, and forgot it for some time. When I went to see after it I found it boiling violently, and instead of the liquid being colourless as when I left it, I now beheld it changed to a most magnificent ruby red, and remaining perfectly clear. You must know that this was in the evening, so solar light could not have assisted. A portion of the solution had boiled over, and had assumed the form of a brightly metallic froth. I at once thought that my bath was entirely spoiled, but determined to preserve it for future experiment. However, the next morning I managed to break the flask, which of course allowed the solution to flow about the room, which caused a most unpleasant mess. I was enabled to save about ten ounces. This has now been kept five weeks, and it is still perfectly clear, without the least deposit. A piece of albumenized paper floated upon it, assumes as soon as dry, a bright metallic appearance. It is extremely sensitive to light, a very short exposure blackening it. It also discolours in a few hours if kept from the light.

Having spoilt my first bath, I made up another—water 20 ounces, nitrate silver 500 grains, gelatine 4 drachms, liquor ammonia 1 fluid drachm. I took care this time only to warm the solution sufficiently to dissolve the gelatine. When *nearly* cold it was filtered. It then stood ten days in a moderately warm room before any trial was made with it. During that time the spongy deposit, that had been thrown down a few hours after the solution was cold, became very much discoloured. The liquid itself had only acquired a yellowish tint.

A few evenings ago I filtered this bath and sensitized some sheets of albumenized paper upon it. The bath was easily filtered through paper, and there were very little tendency to form bubbles. I used two samples of albumenized paper, each from a different maker. I was much pleased with the mechanical properties of the bath. The solution took very kindly to the albumen surface. I noticed that after floating for five minutes the paper itself had not absorbed much moisture, and it dried very rapidly and very evenly. The circumstance of the bath not penetrating the paper has led me to think that it would be a great advantage to use a nitrate bath containing gelatine for plain or resinized paper, as there is every hope that the picture would be more on the surface of the paper than when a plain solution of nitrate of silver had been used.

When the sheets of sensitized paper were quite dry they were rolled up altogether and placed in a cardboard tube, which I ordinarily use to preserve sensitized paper and untouched prints from the action of light, air, and moisture. The following morning I removed the paper from the tube, and was much surprised to find Ordish's paper very much discoloured, and covered with filmy metallic spots, whilst the paper obtained from Messrs. Tibbitts and Lampray remained quite white. I now proceeded to print upon the latter.

I found it extremely sensitive, and it printed to a very blue tone. After washing, the prints looked just as if they had been toned, the colour being of a rich violet-purple. They were then toned in an acetate gold bath, and as the progress of the toning could not be perceived, except by the prints becoming gradually lighter, they were each left for different spaces of time in the bath. They lost very much in brilliancy in fixing, and became of a disagreeable brown colour. Upon drying, they slightly improved, as regards tone, but are still very wretched. One mechanical advantage seems to be that the prints do not repel aqueous solutions, as paper sensitized on an ordinary bath will very often do.

The finished prints whilst wet were exceedingly dull, as regards surface, but, upon drying, gradually re-acquired their gloss.

These few experiments that I have made seem to point to the supposition that paper prepared on a gelatine bath may be very sensitive to light, and that one sample of paper is better suited for using with it than another. I hope soon to try some other samples, besides those that I have by me.

HOW TO PRODUCE A CLEAN PICTURE ON PORCELAIN.

BY PROF. TOWLER.*

It was our belief that all photographers knew how to get rid of stains of silver deposit on any part of a collodion plate—even of the picture itself, if necessary; and, taking this for granted, because we have written much about the subject, we have merely insisted, in our instructions on the production of porcelain pictures, that the picture and plate must be *bright* and *clear*. We find, however, we have taken too much for granted; and it is our intention now (*sera nunquam est ad bonos mores via*) to teach such of our readers what to do with the porcelain plate, supposing the picture is good, but the plate parts, as the corners, edges, etc., external to the picture, are stained with streaks, specks, and thunderbolts.

Wash the film thoroughly after it has been fixed, toned, and intensified. Now prepare tincture of iodine as follows:—

Iodine	20 grains.
Alcohol	1 ounce.

Place in front of you a dish of clean water, as also on the right side of the dish a beaker glass full of the same water. Taking the porcelain picture in the left hand, in the usual way of holding a negative, incline it so as to allow the water, with which it was coated in order to keep it moist, to flow off. We will suppose there is a big and unseemly stain on the right side of the head of the vignette, and near the farther right-side corner—a stain that spoils the whole picture. Proceed as follows:—

Let fall upon it a drop of the tincture of iodine, which you will allow to remain until, by spreading, as it will do, and rapidly, it has reached nearly to the hair of the portrait, or, in fact, any contiguous part of the figure. As soon as this is the case, dip the plate quickly in the water in the dish below, and wash off the tincture: be sure to stop its progress. Pour a drop or two of dilute cyanide of potassium upon the same spot where you let the tincture fall.

It may be that this treatment will remove the stain entirely; if not, wash the film thoroughly, and repeat the operation with the tincture and the cyanide. By perseverance the most obstinate specks may thus be removed; in fact, the whole plate, wherever it is stained, is thus clarified. The object of having the dish of water immediately beneath the negative is, to be enabled in a moment to stop the progress of the tincture, lest it should attack any of the delicate markings of the positive (picture), which, of course, would render all further labour with this plate useless. In such a case—that is, supposing by carelessness you have allowed the tincture to encroach upon the hair or face, by which the picture is soon spoiled—use the plate for the following experiment:—

Pour upon the middle of the collodion film, right upon the portrait, sufficient of the tincture of iodine to cover the whole plate; and allow it to act a short time upon the markings of the image, as well as upon any streaks or stains that may be present. Next, wash the film, and flow over it some of the cyanide fixing solution. You will observe that most of the picture and stains have disappeared. By a repetition of the operation it is very probable that the porcelain plate will be perfectly clear and white, and that not a single spot is visible on any part.

Stains, streaks, and specks consist of reduced silver; which, combining with iodine, gives rise to iodine of silver, which in its turn, is soluble either in hyposulphite of soda or in cyanide of potassium. But the picture also is formed of reduced silver: it is therefore evident that the chemical materials which will render one soluble will have the same effect upon the other. Hence the reason of the utmost precaution and care in the manipulations, so as not in the slightest degree to allow any of the tincture of iodine to run into the delineations of the portrait. If a stain is deposited on the portrait, there is scarcely any possibility of removing it by the most refined manipulation. Reject the picture and take another.

In this operation of removing stains, or even the whole picture, the collodion film remains intact; so that the operation is well called a clarifying process, which was first made use of, we believe, by Mr. Osborne, in Australia, to produce clear blacks and whites in his photo-lithographic process.

How to Tone and Intensify a Picture on Porcelain.—It would be well to coat the porcelain plates with a dilute solution of albumen (one ounce of albumen to eight or ten ounces of water), and allow the films to dry. After this they may be coated with collodion in the usual manner.

Develop with the ordinary iron developer, freshly made, filtered, and diluted one-half; or with the double sulphate of iron and ammonia, as recommended in the "Porcelain Picture." Keep the picture clear; that is, stop the action of the developer before any fogging intervenes. Wash and fix in a bath of hyposulphite of soda, and wash thoroughly.

Flow over the plate a dilute solution of terchloride of gold, and keep it on the plate until the intensifying action ceases or appears to retrograde.

Where the porcelain picture has to be coloured with water-colours by a proper artist, the photographic part of the operation is now finished; but if the picture has to be presented as an engraving, or rather a mezzotint in India ink on a white background, the following additional operation may be performed.

Make the following solutions:—

No. 1.—Bichloride of mercury	1 drachm.
Water	1 ounce.
No. 2.—Citric acid	1 drachm.
Water	2 ounces.

Intensifying Solution.

Of No. 1	1 drachm.
Of No. 2	1 drachm.
Water	10 drachms.

Mix intimately, and flow the still wet plate with the solution until the blacks are sufficiently intense. Finally, wash the plate, dry and mount the picture.

It is not necessary to varnish the picture when it is mounted in a case or frame, because the glass covering will be a sufficient protection.

In all cases we prefer a strong and clear solution of albumen for varnishing porcelain pictures, where varnishing is necessary.

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COPYRIGHT IN ENGRAVINGS AND PHOTOGRAPHY.

GRAVES *v.* ASHFORD AND ANOTHER.

This was an action in the Court of Common Pleas, before Lord Chief Justice Erlo and a special Jury to recover damages in consequence of the plaintiff's copyright in Sir Edwin Landseer's "Highland Nurses" and in Mr. Faed's "My ain fire-side" and Daddie's coming" having been infringed.

The Solicitor-General and Mr. Montague Williams appeared for the plaintiff; and Mr. Coleridgo, Q.C., and Mr. Row for the defendants.

The plaintiff was the well-known print publisher in Pall-mall, and the defendants were dealers in photographs in Newgate-street. The plaintiff's case was that he had purchased the right to publish prints engraved from the pictures in question, and that photographs of "My ain fire-side" and "Daddie's coming" had been purchased at the defendant's shop. A photograph of "Highland Nurses" had been purchased of Mrs. Jackson, a photograph seller at Leamingtou, and she had bought it of the defendants. Evidence was given that these photographs appeared to have been taken from the plaintiff's prints, and it was said that the sale of photographs such as these was extremely injurious to the business of printsellers.

In the course of the examination a curious question was raised with respect to the amount of damage, if any, for which the defendants were liable. It may shortly be stated thus:—

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* From *Humphrey's Journal.*

Admitting that the sale of photographs of prints damaged the sale of those prints, what amount of damage to Mr. Graves's picture had the sale of a single photograph caused?

On the question of general damage, Mr. Graves deposed that owing to the injury done to his business by photographic piracies he had reduced the number of his plates from 70 to 35.

Evidence was given by M. Joubert and Mr. Stephenson, the engravers, that the photographs in question were taken from prints, and not from photographs, but it being admitted that "Daddie's Coming" and "My ain Fireside" were in fact taken from engravings, the inquiry into this portion of the case was mainly confined to the mode in which the "Highland Nurses" had been copied. Two photographs of the same subject being placed in M. Joubert's hands by Mr. Coleridge, one taken from a print, and the other from a photograph, he correctly distinguished between the two, though to ordinary eyes there seemed no difference between them.

Mr. Coleridge expressed his doubt whether the sale of sixpenny photographs at all interfered with the sale of five guinea prints, while it was clear that the value or fame of the original picture was not at all depreciated by the new system of multiplying copies. As to the facts, the defence was that the two engravings from Mr. Faed's pictures had not been sold by the defendants. As to the "Highland Nurses," it appears that Mrs. Jackson said that she bought it of the defendant not later than March, 1864; and according to the statute, the action for infringement must be commenced within six months of this time. The present action was not brought until after the expiration of this period, and therefore it would not lie. Another defence was that "Highland Nurses" was a photograph of a photograph, and that this was no infringement of copyright. He also said that no doubt his Lordship would rule as it had been previously ruled in "Gambart *v.* Ball," and he should therefore tender a bill of exceptions.

His Lordship said that it would be better to reserve the point, with leave to appeal.

Mr. Coleridge said he should also raise several technical points of minor importance.

Mr. Ashford, one of the defendants, said that he was not aware of having sold the photograph from Mr. Faed's pictures. He never saw any such on his premises, nor had they ever been included in their list. All the copies they had of the "Highland Nurses" had been supplied to them by Mr. Mayers, a photographer of Dublin.

The other Mr. Ashford gave similar evidence.

Mr. Mayers stated that he did not use the print of the "Highland Nurses," but photographed from a photograph.

The Lord Chief Justice, in summing up, said that he dissented entirely from the Solicitor-General's address to the jury as regarded punishment of the defendants. They had not shown wilful contempt of the law; there was fair evidence that they had not continuously sold photographs of "Daddy's Coming" and "My ain Fireside." It was nothing to the jury that the plaintiff had been injured through sales by persons other than the defendants. They must consider the injury plaintiff had received through sale of those three photographs, and those only. Considering all the circumstances, he thought the damages should be small. And as, upon one of the three photographs, plaintiff would not recover at all, when the points of law involved in its issue should be settled, he asked that the damages on that picture should be named apart from those on the other two.

After a short consultation, the jury awarded 20s. damages on "Highland Nurses," and 20s. for "Daddy's Coming" and "My ain Fireside."

The points of law reserved by assent are these:—

That the proprietor's name does not appear on each print and that a partner to the proprietor has not been made a party to the suit.

That the date of publication of "Highland Nurses" is given diversely.

That the action on that picture was not brought within the period required.

That a photograph taken from another photograph, and not from an engraving, does not come within the Engraving Acts. (The Chief Justice expressed an opinion that this would be a fatal objection.)

That copying engravings by means of photography is not a piracy.

Proceedings of Societies.

South London Photographic Society.

The usual monthly meeting of this Society was held in the City of London College on the evening of Thursday, December 14th, Mr. Sebastian Davis in the chair. The minutes of a former meeting were read and confirmed.

Mr. F. W. Hart read a description of a New Filter and Percolator (see p 606), and illustrated its working; and in answer to Mr. Werge and others, explained that he used chloride of silver to decolourize the nitrate bath instead of kaolin, and that the filtration though his apparatus was twice as rapid as through the ordinary filtering paper and funnel. He filtered through prepared felt, and did not think, so far as his experience suggested, that it would be acted on by the nitrate of silver.

Mr. Wharton Simpson said he had had opportunity of trying one of the new filters, and found its working most satisfactory. It was easy to use, very rapid and perfect in its action.

Mr. Blanchard thought it would be invaluable to photographers when travelling.

Mr. Howard also saw many advantages in it.

After a desultory conversation, in which the Chairman, Mr. Henderson, Mr. Hart, Mr. Werge, and others took part, and a vote of thanks to Mr. Hart, the subject dropped.

Mr. J. T. Taylor then read Historical Notes on Photographs in Colour, (see p. 604).

Mr. Wall, referring to the process in which certain paper yielded a colour similar to the glass underneath which it was exposed, said that negatives might be coloured by hand, and thus coloured prints be produced therefrom which would be invaluable for many kinds of book illustration.

Mr. Jabez Hughes said that a long distance would have to be travelled before they could think of photographs in colour for book illustration. It should be remembered that meagre as were the results obtained hitherto in photography in colour, they were all the result of direct processes in the camera, not prints from negatives. And as the negative and the possibility of rapidly multiplying copies from it, was the essential element of modern photography.

After a little conversation, Mr. Taylor said he remembered something of a Frenchman who stated that he had prepared papers so that different exposure would yield a different colour. His friend Mr. Berry, of Liverpool, had however tried the process, and could make nothing of it.

Mr. Hughes referred to the excitement caused by M. Becquerel's first announcement of his success in producing a photograph in colours. Professor Groves he remembered rushing into Mr. Mayall's establishment, and stating that henceforth the whole character of photography would be changed.

The Chairman said, in estimating the probability of photography in natural colours ever becoming a practical reality, it was important to compare the nature of the results already obtained with that of the ordinary processes of photography. In the latter, the image produced was the result of chemical decomposition effected by light where it impinged; in the former, the pictures seemed to be simply the result of an absorption of the coloured light falling on the plate. He referred to a case in which he obtained some indications of colour in using a collodion containing gum guiacum, and suggested that experiments in that direction might be interesting.

Mr. Cooper related an experience with the same gum added to collodion, which in the course of twelve hours presented successively all the colours of the spectrum, and finally became colourless.

Mr. Taylor said that he had omitted in his paper to refer to Sir John Herschell, who had obtained colour by that gum.

Mr. Hughes mentioned the experiments of Mr. Hunt, in the direction of colour.

After some desultory conversation, in the course of which Mr. Simpson related some illustrations of the foolish grounds upon which some persons had fancied they had obtained natural colours in photography, and referred to the American colour hoax of the Rev. Levy Hill,

Mr. Werge showed some examples of prints in various tints of monochrome. He stated that he believed that Mr, Hill had shown photographs in colours; but that those colours were applied by hand.

Mr. Howard had occasionally seen indications of colour in negatives, such as the sky being blue.

Mr. Simpson said in the early days of collodion and the pyrogallic developer, it was not uncommon to obtain such indications. He had seen a negative Dr. Diamond had taken with four very distinct indications of colour—a blue sky, a red brick house, greenish grass, and some other colours. These cases of accidental occurrence of colour do not, however, point to anything further. Referring to the specimens of M. Niepce St. Victor, he observed that it was very curious that, although the colours were very brilliant, there was no gradation in each colour.

After some further desultory conversation, in the course of which Mr. Blanchard, Mr. Harmer, and some others mentioned accidental productions of colour, a vote of thanks to Mr. Taylor was passed, and the subject dropped.

Mr. H. Cooper, jun., then read a paper on the use of gelatine in the printing bath (see p.). He passed round some very charming specimens, taken with a new portrait lens by Dallmeyer, giving admirable distribution of focus.

Mr. Hughes asked in which direction Mr. Cooper sought his advantage, from the mechanical or the chemical effect of the addition.

Mr. Cooper aimed at both; mechanically an advantage was gained in the silver solution remaining entirely on the surface, and he anticipated greater vigour as well.

The Chairman thought that the fact that the solution remained on the surface would give a great advantage in the use of plain paper, prints by which suffered so much from the bath sinking into the paper. A conversation on the subject followed, in the course of which

Mr. Hughes said that the natural action of gelatine would be to make the printing slower, and he thought it singular that the blue tone should have prevailed.

Mr. Simpson, in answer to question, said, in his experiments, the prints from a gelatine bath were redder and richer in all their stages. His bath was alkaline, but he fancied that Mr. Cooper's probably contained excess of ammonia. A bath of Mr. Palmer's, sent to him for trial, stood a week in daylight without discolouration.

After some further conversation and a vote of thanks to Mr. Cooper, the subject dropped.

The Chairman announced that at the next meeting Mr. Werge would read a paper on Errors in Pictorial Background. The meeting then adjourned.

◆

Correspondence.

CAMARSAC ENAMELS AND SECRET PROCESSES.

Sir,—It is good sometimes in an argument to refer back to the point at issue, and I find the question between M. Silvy and myself to be whether M. de Camarsac, who is altogether "reticent" or "silent" with respect to the mode by which he prints on enamel, is worthy (as is claimed for him by M. Silvy) to be placed on a par with such men as Poitevin, Garnier, Fargier, Wothly, Simpson, Swan, and Woodbury—all of whom, if I mistake not, have made known their processes wholly or in greater part. I think that with due respect to M. Silvy and his wish to place his friend on such a pedestal that not a shadow of such a claim can be made out, and that still less can we, as photographers, believe, as M. Silvy wishes us to do, that M. de Camarsac, by keeping in his own hands the printing on enamels, "renders greater service to the profession, than if he were to publish his process, and let it fall into the hands of every one"—I think that even M. Camarsac himself would smile at English credulity if it accepted such a sophism as this. Ask this simple question—Would M. de Camarsac's enamels be less beautiful than they are now if the process by which he did them were made known? Of course not. Then if M. de Camarsac (as he probably would do) maintained a pre-eminence amongst those who practised or improved the process, he could be no worse off than he is at present—that must be manifest; while if, on the other hand, those who, throughout the world, who applied themselves to enamelling as a form of printing should, by taking Camarsac's process as a starting point, actually advance the art beyond its present condition, then it must be equally manifest that M. de Camarsac, by his present maintenance of secrecy, rather merits the name of an "obstructive" than a "benefactor." It may be said that this is a matter of opinion: so it is; but as the claim of M. Camarsac, as put forth by his friend M. Silvy, is a public question, it is open to argument, and as I only write for the purpose of eliciting the truth, I am quite willing to trust to the acumen of the British public in estimating the difference between a reality and a sham.

Why, M. Camarsac actually places himself in the condition of one who holds a perpetual patent without a specification—as one who, while his advocates talk about enamelling, "the new field open for its use, from the decoration of valuable vases, even to the enamelling of furniture and precious jewels"—who, while the imagination is excited by a glimpse of what this beautiful process can be applied to—expects that the work of one man (who, after all, is but mortal) shall be able to supply the cravings of the civilized world for these "things of beauty." Take the rather long dissertation on art in M. Silvy's letter, all these episodes only seem to point the more sadly to the moral in history of art-secrets carefully kept—so carefully, that the "grim tyrant" has taken away the man and his secret together, and we have to mourn a host of these concealments in ceramic art "crackle" and "lustre" and enamel, and, last and worst of all these losses, the "secret" for producing such stained glass as one sees in the old churches of Nuremburg, the attempt to equal which has baffled all the art-patronage of King Ludwig of Bavaria.

M. Silvy has rather unwittingly, in his last letter, furnished me with a potent weapon in the shape of an example or simile which he will find damages his argument more than he wots of. He says:—"If a photographer were to discover a remedy for cholera, croup, madness, or even cattle plague, unknown to any learned doctor, he would decidedly have a just title to the one of benefactor to humanity. If, on the other hand, a doctor were to discover the method of reproducing natural colours by means of photography, he would be considered as rendering a service to art." Oh! M. Silvy, M. Silvy, what would be thought of you if you should discover a remedy for Rinderpest, and should decide on *keeping the discovery all to yourself*, with the comforting assurance to the public that its patients could be *brought to you* for treatment? When it is estimated that upwards of 27,000 cattle have this year perished of Rinderpest, I shudder to think of your consulting-room, to say nothing of the journeys of your distressed quadruped patients from the Steppes of Russia as from the Wastes of Cumberland. If you carry comparisons into the realms of physic, it is fair for me to use them. Therefore, suppose that I, a physician, made a special study of a disease—say cancer—and that I made a discovery which would enable me to produce results never obtained before, and, indeed, far in advance of all known processes of treatment; supposing that I, having shown that my process was thoroughly efficient, and after I had been courteously invited by my professional brethren to give them some idea how such satisfactory results were obtained, were to turn round, and coolly inform them I considered that by confining myself to the operation of curing cancer I rendered greater service to the profession than if I were to publish my process, and let it fall into the hands of everyone—does M. Silvy know what my professional brethren would think of me? Does he not know that I should be scouted as an empiric? And what use would it be the very saying that I was ready to undertake the cure of all who came to me? The very fact that I was more than a charlatan lay in the proofs that I could do as I said, and could be the means of distributing pleasure, and joy, and contentment over the whole civilized world; but the stigma would remain that I would not, for fear of diminishing my pecuniary gain. Oh! what a storm of indignation would overwhelm my poor little plea of being "a benefactor to humanity."

No; do well. Say that the steam-engine would have been what it is had it always remained in the hands of Watt; or the electric telegraph when perfected and developed by Wheatstone alone; or that any other invention in art or science is benefited by remaining solely in the hands of its discoverer, because we are taught by experience that no art or science has ever been discovered by man which is not susceptible of further improvement under the influence of competition and comparison.

I trust M. Silvy will not think that in what I have said I have overstepped the bounds of fair discussion. I admire the facility with which M. Silvy writes our language; I appreciate the motives which have led him to advocate the cause of M. Camarsac, and I only regret that while no one can admire more than I do the beauty of the enamels, no one can be more convinced that the spirit which induces the utter secrecy as to the mode of their production merits no eulogism. John Anthony, M.D.

Washwood Heath, near Birmingham. December 16th, 1865.

THE SPECIAL MEETING OF THE PHOTOGRAPHIC SOCIETY.

Sir,—I beg to call the attention of the council of the Photographic Society to an irregularity in the proceedings of the Special Meeting on Tuesday last. Major Russell and Mr. Dawson having ceased to become members, the laws of the Society only provide one way—the Ninth Law—by which they can be re-instituted; namely, re-proposal and balloting for. Until this takes place these gentlemen do not belong to the Society. The resolution, therefore, requesting these gentlemen to withdraw their resignation, is quite powerless.

The Chairman evidently was impressed with the illegality of the resolution; but though overruled and allowing it to pass, it yet has no force, being in opposition to the laws of the Society. A Member of the Society.

Sir,—I attended the special meeting of the Society on Tuesday night, and heard Mr. Glaisher accept a lame and feeble apology from Mr. Dawson. If he was satisfied with it, as he appeared to be, it is all right as far as he is personally concerned. In the letters read by Mr. Glaisher in the process of clearing himself, were untrue and insulting statements concerning two other well-known members, whose characters are of quite as much importance to them as Mr. Glaisher's is to him; but Mr. Glaisher deprecated any attention to any other matters except that personal to himself. Matters can scarcely rest where they are, and before Mr. Dawson is permitted to re-enter the Society, he should be equally compelled to retract the offensive allusions in regard to the two gentlemen, and which his own advocates admitted were false.

There was another equally inconsequent result produced. The meeting was called for the purpose of discussing the statements made by Major Russell and Mr. Dawson in the *British Journal*. These statements were discussed, and one of the writers of the statements partially apologized: the other was not at the meeting, neither was any apology made for him; yet, with an amiable enthusiasm amounting to weakness, in my opinion much out of place, both offenders were requested to withdraw their resignation. Surely this was a lame and impotent conclusion to a very serious matter. A Member who was Present.

Sir,—In the very unusual circumstance of a special general meeting of the Photographic Society, to discuss a very unusual as well as a very unpleasant business, it appears to me that the members generally got into a strange fog. Two very singular blunders were committed at that meeting, which apppear to me to render the whole proceedings nugatory. In the first place, a special meeting was convened for a special purpose, and all business beyond that for which the meeting was convened is necessarily null and void. The Ninth Rule of the Society provides that members can only be elected at a general meeting; that they must be duly proposed; and that the election must be conducted by ballot. Now, as Major Russell and Mr. Dawson had publicly left the Society and ceased to be members, it was utterly out of the power of the special meeting to re-elect them, or by any process re-constitute them members.

In the next place, the meeting was called by a special resolution of the council which stated that certain statements of Major Russell and Mr. Dawson were unjustifiable and untrue. Major Russell neither attended the meeting nor communicated with it in any way; neither were his statements either withdrawn, modified, or justified, and yet the final resolution requested him to withdraw his resignation. The matter, therefore, clearly stands thus: the council have decided that Major Russell has made statements which are unjustifiable and unfounded; therefore, he shall be requested to rejoin the society.—Yours truly, X. Y. Z.

Talk in the Studio.

Artificial Ivory.—The *Mechanic's Magazine* says that the process by which the most successful imitation of natural ivory is obtained appears to consist in dissolving either india-rubber or gutta-percha in chloroform, passing chlorine through the solution until it has acquired a light yellow tint, next washing well with alcohol, then adding, in fine powder, either sulphate of baryta, sulphate of lime, sulphate of lead, alumina, or chalk, in quantity proportioned to the desired density and tint, kneading well, and finally subjecting to heavy pressure. A very tough product, capable of taking a very high polish, is obtainable in this way.

Printing in the Dark.—A correspondent sends us a curious illustration of printing in the dark. A piece of sensitive paper being in contact with a printed bill, in the darkness, presents a perfect transcript of the bill, the white portion of the printed bill being on sensitive paper a pale brown, and the letters a yellowish white. Our correspondent says:—"The enclosed is a piece of paper sensitized on a 20-grain gelatine bath, on Saturday. The same night it and some more was folded up by the boy in four thicknesses of paper (the innermost one being a common printed bill), and put in the bottom of a counter drawer, and covered by a large book, thereby keeping all light and nearly all air from it, as I expected: and, this morning, when opened out, the piece with sensitive side next the bill received the impression which you see."

Advance in the Prices of Photographic Apparatus.—We understand that there is a possibility of an advance in the prices of photographic apparatus imminent. The cabinet-makers engaged on this work have held a meeting, and resolved on memorializing employers for an advance of 10 per cent. on the present rate of wages. This will be the preliminary, we believe, to a strike, in case the request be not complied with. We can readily sympathize with the plea upon which this effort is made. It is alleged that the necessaries of life have, of late, increased much in price. This is undoubtedly true, and will press hardly on all whose income is a fixed sum, determined at a time when money was more valuable and food cheaper. We should deprecate a strike, however, for the sake of the workmen themselves. They already receive, we believe, a higher rate of wages than cabinet-makers not connected with photography, and a strike would probably bring a number of other men into this branch, who would require a little training, it is true, but who would eventually, probably, by increased competition, reduce the wages below the present standard. We cannot pretend to advise definitely in the matter. We believe the employers will consider this question fairly, and should they see the propriety of complying with the demand, photographers, we presume, must be content to pay a slightly advanced price for cameras, &c.

Photography and the Printing Press.—The *Pall Mall Gazette* has the following paragraph on some new process in which photography is concerned, but how, does not seem clear:—"Messrs. Sampson, Low and Son's illustrated edition of 'The Pleasures of Memory' is remarkable as introducing specimens of a new method of pictorial art. 'They are produced without the aid of an engraver. The drawing is made with an etching needle, or any suitable point, upon a glass plate spread with collodion. It is then photographed upon a prepared surface of wax, and from this surface an electrotype is obtained in relief which is printed with the type.' If this process could be carried out successfully it would give us an important advantage; the artist's own work would be preserved; whereas, even in good wood engraving, it is always marred more or less. We do not know whether in the book before us we have the first adventures in the process, but if so, the results are by no means discouraging. Some of the illustrations are poor, but others—notably, the figures on pages twelve and forty, and a striking bit of landscape on page twenty-eight—show that the method has distinct and peculiar advantages." We shall take occasion to obtain information on the subject, and return to it in a future number.

Printing Frame for Opal Glass.—We have before alluded to the want of a printing-frame for opal glass pictures, which would permit various sizes of negatives and of opal glasses to be employed, and also allow the latter to be placed in contact with any portion of the negative to be printed. Mr. H. P. Robinson has just devised such a frame, which is manufactured for him by Mr. Meagher. We have during the present week been trying the first made, with complete success. It is very simple and easy to use, and completely efficient for its purpose. Any size of negative up to whole plate may be placed in it, and any size of opal glass, from ninth size to whole plate, may be printed from it, or from any part of it. We purposely examined the prints, frequently lifting the portion containing the opal glass quite away from the rest of the frame, returning it without any especial care, and in no instance was there the slightest blurring or appearance of the print having moved. We have not space for a description of the plan at present, but shall probably do so shortly. [Since the above was written, we have received an interesting communication from Mr. Willis, of Scarborough, containing a description of another excellent frame for this purpose. It will appear shortly.]

Cementing Glasses on Photographs.—Referring to our recent article on cementing glasses on opal pictures, we have ascertained since that Mr. Thos. Ross received from the Society of Arts in 1848 a medal for a method of protecting Daguerreotypes by a glass on the surface with canada balsam. The method, it seems, therefore originated in this country, and not in America.

To Correspondents.

⁂ The Year-Book of Photography.—On Tuesday will be published our annual *résumé* of the progress of the art, in which we endeavour to epitomize the practice of photography, as endorsed by the ablest men. This year, in addition to condensed statements of the usual processes, with the latest improvements, and terse accounts of new processes, we shall have the pleasure of adding many original communications on practical matters of important current interest, from a large number of gentlemen, who have obtained recognition as amongst the ablest practical exponents of the art. The following list of contributors will best suggest the interest of the promised communications :—Dr. Diamond, F.S.A., Dr. Hill Norris, T. R. Williams, H. P. Robinson, James Mudd, O. G. Rejlander, Wm. England, Jabez Hughes, V. Blanchard, Russell Manners Gordon, S. Fry, the "Photographer's Assistant," W. B. Woodbury, W. Ackland, Nelson K. Cherrill, J. H. Dallmeyer, H. Cooper, Jun., A. Brothers, J. W. Swan, J. Burgess, and others.

⁂ With the next number of the Photographic News the Index, Title, and Preface to the present Volume will be issued. The number will contain four pages extra, but there will be no extra charge. With the first number of the New Volume, to be published on January 5th, our readers will receive a photo-lithograph of the apparatus used in celestial photography; Mr. Brother's paper on the subject, now in hand, being compelled, from its length and the pressure on our pages, to stand over until the commencement of a new volume.

N.—The meaning of the passage to which you refer in Mr. Ackland's paper is that 20 drops of glacial acetic acid mixed with an ounce of water are to be added to 8 ounces of albumen.

Halcyon.—The new stereo-lens to which you refer will answer admirably for interiors, including a wide angle, defining well, and working rapidly. So far as our experience goes, sharpness with the globe lens can only be obtained by using a very small stop, and this necessarily protracts the exposure. 2. For keeping films moist during long exposure, see article in the News of Dec. 8th. We have not tried the plan you refer to; but we do not like acetate of silver in a bath. The addition of a soluble acetate, such as acetate of soda, to the silver bath would produce acetate of silver and nitrate of soda by double decomposition. We prefer adding a deliquescent neutral nitrate, as mentioned in the article in question. The use of a second bath, containing, in addition to 10 grains of nitrate of silver per ounce, at least an equal proportion of nitrate of potash or nitrate of magnesia, will secure the end you desire.

Inquirer.—The albumen dry process is too lengthy to describe in this column. You will find many articles on the subject in former volumes. On page 265, Vol. V., of the Photographic News, you will find details of the process whereby Mr. Ferrier's albumen transparencies are produced.

One who would like to know.—The advice given in the treatise to which you refer is not of a practical character, and is out of date. Much, however, depends on a variety of circumstances to which you have not referred. For instance, the strength of the silver bath should be proportioned to the quantity of chloride in the albumen with which the paper is prepared. The tendency of the present day is to use a weakly salted paper and a weak nitrate bath. As a rule, the stronger the nitrate bath the shorter the time of floating. The time of exposure must entirely depend upon the character of the negative and the strength of the light. As a rule, a weak negative is best printed in diffused light, and a dense one in sunlight. We have repeatedly dealt with this subject in our columns, and in Year-Books we have given brief statements of both principles and practice. Neither of the works you name were the aids we should have recommended to a beginner.

Student.—The ordinary protonitrate developer will give brilliant whites in glass positives; or a developer consisting of protosulphate of iron 15 grains, glacial acetic acid 20 minims, and nitric acid 1 minim, will give good results. If you wish to get the white which mercury produces, a 20-grain solution of bichloride of mercury will answer. It has the disadvantage of giving at times a cold bluish white. The preparation of the "alabastrine solution" is a trade secret, which has not been published. 2. The marks which you describe as the result of varnishing arise from a partial dissolving of the film at the spot where the varnish is poured on. This arises from a combination of causes, partly owing to the soluble character of the pyroxyline, and partly from the solvents of the varnish being strong. One remedy consists in varnishing the plate cold, and when the alcohol has evaporated, leaving a dull surface, then holding the negative near a bright fire until the varnish is bright and clear. Another remedy consists in changing the sample of collodion. Another in treating the collodion film with dilute albumen or gum water before drying; this will protect the film and prevent the varnish from dissolving it. Another remedy consists in leaving the varnish for some time with the stopper out; the alcohol will imbibe water from the atmosphere, and the varnish will become thicker from the evaporation of spirit and bath: these things will lessen its solvent tendency. The Year-Book will be out in a few days.

Lux et Salus.—Thanks. But your letter arrived too late to enable us to put the matter in its proper place in the Year-Book. We are at this moment suffering from a plethora of matter for its pages; but if we can get the matter in briefly, we shall be glad to do so. We shall have pleasure in publishing it in the News.

George Willis. Thanks for your interesting communication. The frame appears excellent. The description shall appear shortly.

Alex. Taylor.—You can take reduced copies of drawings in the camera as collodion positives. It would be possible also to print reduced copies on paper in the camera, and then develop. But if you require reduced paper prints, the simplest plan is to produce a negative at once. Any other plan would be more trouble and less successful.

Ignoramus.—We have received a letter intended for you, on the subject of exchanging accessories. We will forward it on receiving your address.

Z. Z.—The only enamel plates which can be purchased ready for use are those with a convex surface, used by enamel miniature painters and watch-dial makers. These might be used for camera printing, but not for printing by superposition, but flat plates could be doubtless procured to order. The manufacturers of such things reside chiefly in Clerkenwell. We do not remember the address of any; but could doubtless ascertain.

K. L.—Have your side-light east in preference to west. 2. We prefer using a toning bath over and over so long as it possesses any toning power. 3. The discolouration of the silver bath arises from its contamination with organic matter. 4. One grain of chloride of gold will tone much more than one sheet of paper. 5. The toning bath is best used warm in cold weather. 6. Four hours' washing with constant change, if judiciously done, will generally remove all the hypo. 7. If the difficulty attending the use of rock crystal were not greater than the advantages, it would have been employed long ago.

G. F. suggests a scheme for establishing a general agency in London for photographers, somewhat like those of the scholastic and other professions; and asks our opinion thereon. We have not sufficient familiarity with the working or purpose of such agencies to offer an opinion of any value, and the proposition is not sufficiently definitely placed before us to enable us even to make a suggestion as to the probable success of such an undertaking.

Errata.—The following corrections are needed in Mr. Ackland's paper in our last:—On page 593, the "plain pyro solution" should read "pyrogallic acid 100 grains, absolute alcohol 2 ounces"; and the "acid pyro solution" should be "pyrogallic acid 8 grains, citric acid 2 grains, distilled water 4 ounces." And in the 27th line from the bottom of the second column of page 593, for "silver" read "pyro." Mr. Ackland adds that, in justice to our printer, he begs that these errors may be ascribed to himself.

Several articles in type are compelled to stand over from the pressure on our space. Several correspondents in our next.

Photographs Registered during the past Week.

Mr. H. Burton, Bradford,
Portrait of Sir W. Hamilton.
Mr. Duncan Mensies, Galashiels,
Four Portraits of Rev. John Pollock.
F. R. Elwell, M.A., Weston-super-Mare,
Photograph of Weston-super-Mare.
Mr. W. T. Doyle, St. Abbey-street, Dublin,
Portrait of James Stephens.

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GELATINO-CHLORIDE OF SILVER.

Since writing our short account of Mr. Smith's operations with chloride of silver in gelatine, we have been favoured with a call from Mr. J. E. Palmer, of Stonehouse, who has described his operations with the same material, and shewn us some examples on opal glass. It is somewhat singular that Mr. Palmer has no specific mode of rendering the gelatine insoluble, but has found it possible to obtain pictures, using it as a vehicle, without much trouble with the image dissolving, as it has, more or less, in all our experiments. The only addition he has made to the gelatine solution, beyond the chloride of silver, has been spirits of wine and acetic acid. These, it is probable, would check the tendency to dissolve readily in water; but we are still disposed to believe that the characteristics of different samples of gelatine have something to do with the difference in results. This is a point, however, which further experiment will determine.

Our conjecture, expressed some weeks ago, on first seeing some of Mr. Palmer's pictures on paper, to the effect that they were taken on albumenized paper, turns out to be correct, an unsalted example of albumenized paper having been used as the basis of the gelatino-chloride; in which case we could readily understand that the gelatine film was protected from solution by its combination with the albumen. The method then adopted has been modified; but it may be briefly stated as follows:—Four drachms of gelatine were dissolved in one ounce of glacial acetic acid, and then added to four ounces of water, to which were also added the necessary proportions of chloride of ammonium and nitrate of silver, adopting the rule we recommended some time ago of using five grains of the latter to one of the former. The solution having been warmed sufficiently to make it fluid, was poured on to the surface of albumenized paper containing no chloride, and thoroughly dried. It was then thoroughly fumed for half-an-hour or more with ammonia to neutralize the acidity; and finally, printed, toned, and fixed in the usual way.

In Mr. Palmer's more recent modifications the formula stands as follows:—

Nelson's gelatine...	1 ounce
Water	25 ounces
Spirits of wine	10 „
Acetic acid	a few drops*

To each ounce of this are added:—

Chloride of ammonium	3 grains
Nitrate of silver	15 „

The gelatine is first soaked until it is soft in five ounces of water, and then a pint of boiling water is added. When fluid, the alcohol, acetic acid, and necessary proportion of chloride of ammonium are added, and finally the nitrate of silver.

The paper is still prepared with albumen, the solution being made as follows:—

Albumen	2 ounces
Water	6 „
Liquor ammonia	a few drops.

Saxe paper is immersed in this for about a minute, and then drained and dried. It is then coated either by floating on the solution of gelatino-chloride of silver, or by pouring on the latter like collodion. The toning, fixing, &c., are conducted in the usual manner.

For printing on opal glass the same preparation is used, and the plate receives no preliminary coating. The printing must be very deep, the picture being quite bronzed, the toning, fixing, &c., being effected in the usual manner.

For printing on canvas the same preparation is used. The canvas is first treated with dilute albumen, which is rubbed on with a sponge, leaving only a slight trace of the albumen on the surface. The canvas is then formed into a trough by turning up the edges, and the gelatino-chloride solution is poured on. The picture is then printed, toned, and fixed as usual.

This last appears to be the most important of its applications. Mr. Palmer has, for some time past, applied it to printing enlargements on canvas by means of the solar camera and development. If gelatine alone were used, there would, however, be some danger of its cracking in a very dry or warm atmosphere, a danger which might, however, be obviated by the addition of a little glycerine to the gelatine preparation. Theoretically, also, the use of a hygroscopic substance like gelatine might seem unsafe for the basis of a painting of any value; but on this subject experience will be a better guide than theory.

Mr. Palmer's visit to town was partly for the purpose of obtaining, if possible, some suitable substances, such as fine canvas, white oil-cloth, &c., to serve as a basis for this kind of printing; and some samples of very fine prepared canvas and white papier mache, which we had used for collodio-chloride of silver printing, which we shewed him, appeared to meet his wants. In our own experience there has been a tendency in all materials prepared with white lead to produce imperfect whites when used for silver printing. This is not, however, a matter of serious importance when the photograph is merely used as a basis for an oil-painting.

A question will now arise as to the use of chloride of silver in gelatine, whether Mr. Smith intends by his specification to claim such a combination of gelatine and silver as a portion of his patent, or whether he claims simply a certain application of this preparation. If he intend to claim the use of chloride of silver suspended in gelatine, a further question will arise as to the validity of such claim. Two considerations will arise in estimating the claim. First, whether the use of chloride of silver had been published before the date of the patent; and secondly, whether the possibility of suspending chloride of silver in viscous solutions, such as collodion, having been demonstrated and published by ourselves, would not preclude a patent for merely varying the viscous solution, and substituting gelatine for collodion.

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* Mr. Palmer uses just sufficient to make the solution taste acid.

In regard to the publication of the use of chloride of silver in gelatine, much will depend on what legally constitutes publication, and of that we are uncertain. We had used it twelve months ago, but with so little promise of advantage, that we abandoned it after a hasty experiment, and made no mention of the fact. Mr. Palmer states that he has used the preparation for three years; but he has kept it a secret.* The use of gelatine for holding chloride of silver in solution was suggested in the course of a discussion on the collodio-chloride process in March, at a North London meeting: but the suggestion of a possibility is not the publication of a fact. If the suggestion of untried possibilities were sufficient to bar patents, it would be tolerably easy to close the Patent Office by forestalling by suggestion all possible or impossible inventions. It is possible, however, that some one may have actually used and published this preparation before the date of the patent, and if so, we shall doubtless hear in good time.

On the whole we are inclined to believe that the mere use of chloride of silver suspended in a solution of gelatine could scarcely be protected, it being really—no matter what its origin—practically only a modification of the collodio-chloride process. Both methods of printing depend on the use of chloride of silver suspended in a solution sufficiently viscous to prevent the precipitation of the chloride. In one case a solution of pyroxyline is employed, and in the other a solution of gelatine. We further think that it is not the use of gelatino-chloride of silver which Mr. Smith claims in his patent, but its combination with other things in the system of printing he employs. We think this because in producing his images he does not confine himself to gelatino-chloride of silver, but uses the ordinary methods of printing in combination with his system of "bases" and "receptives."

It is difficult to speculate on the value of a process until its capabilities and applications have been fully tested. So far as we can see, the most valuable application of this process will be in the production of photographs on canvas, &c.; but express provision should be made for its absorption into the ground, or there will always be a risk of its cracking off, even after the picture is painted. So far as we can judge at present, for paper and glass it is less suitable than collodio-chloride of silver, being somewhat more troublesome to use, and less likely to be stable in result. Gelatine is more liable to mechanical injury from moisture, and more prone to decomposition than collodion. Regarding the excellence of results by each process, it is not necessary to enter into comparison, beyond remarking that we have not seen any better results produced by gelatine than by collodion.

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A FEW THOUGHTS ON "WHAT SHALL WE DO THIS DARK WEATHER?"

BY EDWARD DUNMORE.

How many photographers mentally put this question to themselves, and how few succeed in finding a satisfactory answer!

There is no doubt there are many things may and ought to be done which, were the weather brilliant and satisfactory in a photographic point of view, never would be. "Making it pay" overrules most other considerations, and the business of accumulating pounds, shillings, and pence reigns supreme.

If we happen to be of an enquiring turn of mind, with the idea few things are so perfect but that they may be improved upon, the experiments of the past season—a season most prolific in new processes and modifications of old ones—can be reviewed; negatives and prints can be compared; the qualities of any special process considered calmly and carefully; and the old copy-book axiom that "Comparisons are odious," thoroughly and decidedly refuted; so that we may select those processes that average the best results for our next season's campaign.

There are few photographers that have no cause of complaint in some inconveniences or short-comings of their dark rooms or studios. Can they do better than endeavour to remedy the defects? Probably a little reflection and time to spare might save much of the trouble and inconvenience that the pressure of business in fine weather makes us tolerate; moreover, some happy thought might not only assist ourselves individually, but be of use to others, and make another addition to the advance of this particular science. Few great discoveries have been made otherwise than by accident. Some simple experiment may lead to some glorious result that the study of years has failed to elicit. Perhaps, had we spent our non-photographic seasons in reviewing and considering the faults and failings of the fast working hours, we might—I don't say we should—have advanced the art as much in six months as we have done in the same number of years. There are, however, some who have adopted this plan. Mark the result. Not only have they become the first men in a new science—looked up to as authorities—but have conferred blessing on society in general by the introduction of new and invaluable processes, giving employment to thousands, and supplying the ever increasing requirements of advancing civilization. Unfortunately we generally leave such men to help themselves, contenting ourselves with imitating, without an attempt to assist. Would that the bulk of those who practise this art try to advance as well as practise it; we should then enter upon a new era, raise the status of a numerous body, calling themselves photographic artists, both socially and artistically; gradually yet surely removing much odium that men unworthy the name have caused to be attached to an industrious and intelligent class. Surely, then, we need not wonder what we shall do, with such a field for discoveries open before us. We may sum up all by the determination to do whatever we can to improve the practice and advance the interests of photography as an art, regardless whether it is remunerative or not in a commercial sense; for money, although it may do much to advance science, as often impedes it, when the profit of a process only enters into consideration. Let us therefore be liberal, for a little knowledge from one of many sources will, in the aggregate, form a startling whole; and although insufficient in its atomic state to produce much good, will, as a whole, achieve wonders, and produce that we all desire—perfection.

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THE LATENT IMAGE, AND THE PHENOMENON OF RE-DEVELOPMENT.

BY JAMES EWING.*

The subject of the nature of the latent image is one which has interested photographers since the commencement of the art, and, so far as regards the simply iodized silver film, is still a matter of serious controversy, one class of theorists holding that it is a chemical, whilst another class hold that it is a physical, change which occurs on the exposure of the sensitive surface to light. Between these different theorists there has been such a great deal of profound, ingenious, and intricate argument brought up to substantiate their views, that one could almost wish that some one of them had been correct, and so end the disputed point or change.

We had almost expected this dispute was at an end when Mr. M. Carey Lea entered the lists as champion for the "final establishment" of the "physical theory," and more especially so when he stated that his arguments and experiments were of such a conclusive character as to cause him to believe that the subject was "now closed." Would it were so. But it would seem that such is not the case, as our President, Mr. Long, following up the same train of experiments, has been led to a totally different conclusion, and, as I think, has shown that both a chemical and something akin to an electrical condition is induced in the film by the action of light.

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* Mr Palmer promises to send us the testimony of an independent witness o the fact that he has used this preparation for years. Whether this will onstitute publication in a legal sense or not is a question for patent awyers.

* Read at the Glasgow Photographic Association, Dec. 7.

Mr. Lea's strongest argument against the chemical theory is his having used the pernitrate of mercury to dissolve off the reduced silver image, and on the success of this experiment asserts that the image only rests on the film of iodide:—"The film was left perfectly smooth and uniform, thus forbidding the conclusion that any part of the iodide or bromide had been consumed to build up the image." Further: had such "been consumed in forming the negative, the film would be left thinner on those parts which correspond to the dense parts of the negative, and thus the negative would have been converted into a thin, pale positive."

Mr. Long, in following up this experiment, found that the solvent used by Mr. Lea had the quality of dissolving off not only the reduced silver of the image, but also the iodide forming the film, which, Mr. Long affirms, may account for Mr. Lea not finding a "vestige," and consequently he was induced to try a more likely solvent, viz., pure nitric acid, and strange to say found that which Mr. Lea affirms should be found if chemical decomposition does take place—the "thin, pale positive" beautifully detailed in the body of the film. Both gentlemen used bromo-iodized collodion. Mr. Long, still following up the experiment, found he could recoat the feeble image with the developer to an equal intensity as that possessed by the original picture. This, indeed, was very curious, as the film of iodide seemed to be cleared away on the parts impressed by the image, and it was on those transparent parts that the dark image settled. When Mr. Long performed this experiment in our presence last evening, the thought struck me that it was quite possible, even although the iodide seemed removed to some extent on those parts, that the portion forming the mould in the film might still possess that attractive power imputed to the physically-affected iodide; and that if the iodide were entirely removed by cyanide of potassium, I wondered whether an image could be developed. On asking this question from Mr. Long, he hazarded the remark—"I believe it would."

Since then, through the kindness of that gentleman, I was permitted to see the whole of the experiments carefully and leisurely gone over in his laboratory, and the experiment last mentioned really surprised me. After dissolving off the silver image and finding the phantom, the plate was carefully washed, and that with every precaution, as the collodion was waving to and fro on the glass; drained, and again applied the developer, when the ghost of the banished image rose, thin, indeed, but sufficiently intense and detailed to tell of some strange power induced in the collodion film itself, capable of rearing up the image.

In some experiments I made afterwards it occurred to me that the attractive force in the collodion film might attract other particles of matter equally as well as the pyro, and silver or iron and silver, and that if such could be done a carbon precipitate might be made to occupy the place of the silver deposit, and yield more permanent pictures than those afforded by the silver. I therefore prepared a solution of gum and China ink, and poured it over the plate as a developer, but to no purpose. I then tried several precipitating liquids, yet the image retained its feeble appearance. Washing the plate, and again redeveloping with the iron silver and acetic acid, the dark image reappeared. It would thus seem that this film was impressed with a particular attraction for a particular precipitate; that it would attract the molecules of no other precipitate than that of silver; at least, such was my experience.

Working only with transpariencies printed from negatives by means of a yellow screened jet of gas, I was not quite sure whether a heavier body of material could be placed upon the film by reason of this attractive principle. To ascertain this I changed my mode of operation by printing negatives from transparencies. To effect this properly I desired more light, and carelessly left the gas jet unscreened after I had commenced to develop my picture. Witness my chagrin when it came out a transparency from a transparency. Could it be possible that the process was only capable of producing positives not only from negatives but also from transparencies, dissolving out the result? I again developed, and again obtained nothing but a transparency. I then discovered that the light was unscreened, and that this mysterious change took place under the reverse action of light. Adjusting the screen I used a new plate, placed it under the transparency, and had, as the result, a good bold negative; dissolved and redeveloped again; again dissolved and redeveloped. I was desirous of knowing how often this could be repeated; but, after the second trial, the film, not being lined with varnish, began to move off, and I ceased to push it further.

Satisfied that almost any image on collodion could be dissolved out and again rebuilt by the developer, I got some old unvarnished positives, lined them, steeped them in water, and dissolved out the silver. I got deep indentions of the picture in the film (so well marked that I thought they might be applied to Woodbury's mould-printing process), washed carefully, and again developed the images, as strong if not stronger in intensity than they were originally. I could not help thinking this an extraordinary occurrence, as some of those positives were weeks, and others days old, and yet that attractive power was still resident in the film. I might almost venture to say that this curious principle may yet be turned to some account photographically, as the image returns nearly as strong as when first developed.

Apart from a chemical or physical view of the question, a mere tyro in the art would be very apt to ask—On what does the image rest after the foundation is removed, which really occurs when the cyanide of potassium is used to dissolve out all the iodide or bromo-iodide in the film? If there be no attractive power left in the film of collodion for the silver image, by what species of attachment does it adhere to the normal film? If there were none, I am afraid that the argent building would find a simile in the old parable of the house that was built upon the sand, on which it is said that the wind blew, and the rain fell, and eventually it was swept away. It cannot be by simple mechanical adhesion, or I am afraid it would indeed be swept away by the after processes through which it has to pass.

My humble opinion in the matter is, that the finding of "the feeble image" in the collodion somewhat shakes my faith in the physical theory, and more conclusively so when Mr. M. Carey Lea states, *if chemical decomposition does take place, the same should be found.* This "thin, feeble image" seems to me the foundation on which the structure is built. Remove the material, you have the stamp on which, by a most mysterious influence, you can again rebuild. This influence is attributed by the physicists to the physically-affected iodide. Remove the iodide, have your glass evidently perfectly transparent, and yet, without the apparent presence of the iodide, you can again summon by the aid of the developer the phantom image from the "thin" film. Really this is a mysterious and wonderful power, seemingly akin to the electrical or magnetic.

The Editors of *The British Journal*, in making remarks on Mr. Long's paper, says:—"If Mr. Long had been working with a simply iodized collodion free from organic reactions with nitrate of silver, it is in accordance with our experience that when the fully-developed image is treated with nitric acid before fixing the image only would have been removed, without leaving any trace of it visible on the iodized film." To test this I made a little collodion, using pure ether, alcohol, and a little gun cotton I made some time ago, iodized with from eight to ten grains of pure iodine; sensitized in a bath of thirty grains of silver to the ounce of water; got images not so intense as I would have wished; dissolved them off, and had the usual feeble image in the film after being a quarter of an hour steeped in nitric acid, so that with the purely iodized film I got the same result as with the bromo-iodized.

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PHOTOGRAPHIC PIRACY STOPS THE WAY.

At the Mansion House, on Boxing-day, several men and lads were brought before Alderman Sir R. Carden, who sat for the Lord Mayor, charged by the police with obstructing the thoroughfare.

The evidence went to show that they had been seen at various places in Cheapside and in the vicinity of the Mansion-house and the Royal Exchange selling counterfeits of an ingenious little puzzle which had been brought out for the Christmas holidays by the London Stereoscopic Company. It was called the "Caligraphic Mystery," and consists of cards each about the size of an ordinary carte de visite, upon which are printed little familiar sayings and household words in a peculiar kind of type, requiring some little art and patience in deciphering, but when deciphered affording amusement and gratification. The police proved that the manner in which the defendants vended these counterfeit articles caused much obstruction to persons on foot, and that the annoyance was increasing from day to day.

Mr. Nottage, the manager of the London Stereoscopic Company, explained to the Bench that the Company had produced the original puzzle, of which those sold by the defendants were counterfeits, at very great cost, and a vexatious system of piracy was being resorted to for preventing and forestalling the legitimate sale. Nor was the piracy confined to this particular article. No sooner did the Company produce anything which became popular than persons like the defendants came and hawked it in front of their shop in Cheapside in a spurious shape and at a tithe of the price at which they themselves were able to sell it. The defendants themselves were so poor and insignificant as to render it not worth the trouble of the Company to proceed against them in a legal way for the piracy, but the Company had felt it right to appeal to the Lord Mayor to protect them in some way and to prevent such people selling their counterfeited productions under their very noses. The Company could not sell the article in this case at less than 6d., but the defendants sold the counterfeit at a penny, and so greatly interfered with the legitimate sale of the genuine puzzle. The Company, besides, made such things very popular by advertising them extensively and at great expense, and the defendants, taking advantage of that, vended the pirated articles at a sixth of the cost of the genuine ones, and in front of the Company's own premises.

Alderman Sir Robert Carden said it was certainly a great shame, but he could only protect the complainants by dealing with such cases as obstructions of the public thoroughfares. It was the same everywhere. He knew that Mr. Graves, the eminent engraver and printseller in Pall-mall, was now trying to obtain an Act of Parliament with the view to assimilate the English law with that of France, and so the better to protect the copyright in prints and engravings. It was a common thing in his experience to find engravings which he could only sell at two and three guineas each photographed and sold at a few shillings shortly after he had brought them out, and it was to protect himself and others in the same position from that species of piracy that he was now trying to procure an amendment of the law.

Mr. Nottage said he did not wish to press hardly on the defendants, but the Company had expended between 300*l.* and 400*l.* on the production of the article in question, and it was hard to have the legitimate profit upon such an expenditure filched from them.

Mr. Oke, the chief clerk, told the defendants that they themselves not being the makers of the articles they sold, they had infringed an Act of Parliament by selling them without a hawker's licence.

Sir Robert Carden eventually discharged the defendants with a caution' on their promising not to offend again, and giving up the stock of counterfeit cards found upon them.

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Photographic Engraving.—An American patent in connection with this subject, is, in an abstract, curiously described as for "the use of a spectrum for the purpose of producing line engravings from transparent photographs."

Correspondence.

PHOTOGRAPHY IN COLOURS.

Paris, December 27th, 1865.

On Monday last M. Poitevin brought before the Academy of Sciences a very important note respecting his researches recently undertaken with the object of obtaining, upon paper, pictures which shall represent the natural colours of objects.

M. Poitevin first endeavoured to ascertain whether the action of light upon violet sub-chloride of silver would not be facilitated and rendered more complete by the presence of substances which should be themselves modifiable by light. Bodies that absorb the chlorine, and combine with it chemically, produced nothing in M. Poitevin's hands. Not so, however, with those bodies which have a tendency to let either chlorine or oxygen escape, always provided that they do not act spontaneously—that is, without light—upon violet chloride of silver. Among those he experimented on, M. Poitevin mentions chromic acid, either free or combined with bases in the alkaline bichromates, such as the nitrate of uranium. The nitrate of silver also acts in this manner, but it decomposes, and takes a dark colour, which prevents the picture from becoming visible.

After many attempts, the author succeeded in obtaining a reaction that gave him the desired result. The violet sub-chloride of silver, which he forms with white sub-chloride of silver, submitted to the action of light and of a reducing substance, colours but slowly and very incompletely when exposed to the sun, through a negative or a transparent design in various colours. It is, on the contrary, modified very promptly, even in a diffuse light, when it has first been slightly coated with an aqueous solution of free chromic acid, or of an alkaline bichromate. Then this sub-chloride, which has a chesnut-coloured or a dark violet tinge, becomes white in the white parts of the cliché, and coloured in the other parts of the same colours which exist in the other portions of the image.

With the help of these observations on the simultaneous action of the light and certain oxygenized salts upon violet chloride of silver, M. Poitevin formed a process which may be thus resumed:—

The photographic paper, having been first covered with violet sub-chloride of silver, is coated with a mixture of the three following solutions in equal volumes:—

1. Saturated solution of bichromate of potass.
2. Saturated solution of sulphate of copper.
3. Five per cent solution of chloride of potassium.

For the bichromate, chromic acid might be substituted, but without any noteworthy advantage.

The sulphate of copper facilitates the reaction, and the chloride of potassium prevents the whites that are formed from passing into grey.

This preparation is as sensitive to light as is white chloride of silver with an excess of nitrate, and it may be acted on by contact through a transparent picture on glass in from five to ten minutes in the sunshine; but this time varies according to the intensity of the light and the greater or less transparency of the coloured design that serves as a model.

M. Poitevin confesses that this paper could not be employed advantageously in the camera; but he declares that, as it is, it may be used for the printing of coloured photographs by contact or by amplification.

The operation may be followed and stopped when the impression is judged sufficient, then the picture is washed in water acidulated with chromic acid or containing sulphuric acid and an alkaline bichromate to dissolve the preparation. After being washed in ordinary water, the picture is put into a bath of water and bichloride of mercury, then in water containing nitrate of lead; lastly, it is again well washed with water.

These pictures may be kept in an album, but they cannot resist the direct action of the sun.

This communication is certainly a very interesting one, for it opens up a new road for such investigations.

Yet an examination of the specimens convinced us that the results obtained by contact with the help of M. Poitevin's process are far from being more complete than those produced in the dark-room by M. Niepce de St. Victor. Further, the question of permanent fixing still remains to be resolved.

In any case, we have now two able and persevering searchers in the pursuit of the interesting solution. There is every ground for hoping that their united efforts and their emulation will have a permanent outcome.

About this time last year, M. Emile Labédollière, with the collaboration of M. Ildéfonse Rousset, published a splendid volume, entitled *Le Tour de Marne*, which was entirely illustrated by photography. The same authors have just brought out a new, no less complete, entitled *Le Bois de Vincennes.* It is filled with animated scenes, sites delightfully chosen, tableaux which seem composed by a great master, but which Nature herself has formed.

The illustrating of books of travel, of works at once picturesque and historical, is indeed one of the happiest applications of photography. In the two volumes I speak of, this application has been most worthily carried out, and has met with the most encouraging response from the public.

Ernest Lacan.

THE SPECIAL MEETING OF THE PHOTOGRAPHIC SOCIETY.

Sir,—Are not some of your correspondents last week rather hasty in their assumptions regarding the resolution of the Photographic Society's meeting, and also regarding Mr. Dawson's intention in withdrawing his statements and expressing an apology?

If I understood the proceedings rightly, he withdrew his statements generally, without any qualification of any kind, and apologised equally generally; that being the case, all errors and misstatements were withdrawn and regretted. It would have been a farce to apologise with certain unexpressed reservations; and I think it would have been unfair to press for a categorical retractation of every offensive statement or remark which had occurred in the course of an angry correspondence. The three persons concerned, individually, were Mr. Glaisher, Dr. Diamond, and yourself; but in a general sense the whole Society had been affronted, and when the meeting generally showed a disposition to accept a general apology, which was tendered, I don't think that it is quite fair to press the matter further in that direction.

Regarding the renewal of membership, all the resolution was meant to do was, I think, to pave the way for the erring members to return. Of course nobody imagined that they could be elected again by a resolution passed in that way, nor do I fancy that either of the gentlemen would care to creep back again into the Society in such an informal manner; but after a resolution of that kind it becomes easy to them to be re-proposed and balloted for in the usual way. If I am right in my interpretation of the proceedings, I think that the unreserved apology should be followed by a general amnesty, and, I hope, a permanent peace.—Yours, Sir, faithfully, A Member who hates quarrels.

[Our correspondent's view of the case is neither unfair nor unnatural; but it should be made to appear that it is the true one in order to secure the results for which he hopes.—Ed.]

Sir,—In the short account of the proceedings at the special meeting of the Photographic Society, published in the last number of the Photographic News, you state that I apologised to Mr. Glaisher, and that my apology was accepted. This is an error, which I trust you will correct in your issue of this week.

The real facts are these. I was prepared there and then to substantiate my published statement; but finding that the almost unanimous feeling of the meeting was opposed to the discussion of the personal question between Mr. Glaisher and myself, on its merits, I, for the sake of peace and harmony, consented to waive discussion, and to withdraw my statement on the expressed understanding that the matter should here end.

No apology was made on either side, and therefore none could have been accepted. I am, yours, &c.,

Geo. Dawson.

King's College, London, Dec. 27th, 1865.

[The meeting certainly understood Mr. Dawson to apologize; hence, when Mr. Mayall rose and proposed a resolution (previously prepared) to the effect that the meeting was satisfied with Mr. Glaisher's statement, and that an apology was due to him from Mr. Dawson, he was answered by several voices with cries of "He has apologized:" whereupon Mr. Mayall said he would alter the termination of his motion and substitute—"and that Mr. Dawson's apology be accepted." On his resuming his seat to re-write the resolution, Mr. Davis, who had been absorbed the last few minutes in writing, and had not apparently heard Mr. Mayall's resolution, rose and proposed a resolution for the same purpose, expressed in more general terms. We have before said that the proceedings were confused and irregular, and we believe that Mr. Mayall did not again put his resolution; but many left the meeting—and amongst them, we believe, Mr. Glaisher—with the conviction that it had been put and passed. Mr. Dawson must, however, know best what he intended, and we are sorry that we attributed to him a more ample *amende* than he intended to make.—Ed.]

PHOTOGRAPHY IN NATURAL COLOURS.

Sir,—In Mr. J. Trail Taylor's paper in your last, entitled "Historical Notes on Photography in Natural Colours," a typographical misnomer has crept in, as I presume Mr. Taylor refers to a method of copying natural colours contributed by me about nine or ten years ago to a small *brochure* compiled by Mr. John Thompson, of Ross and Thompson's, Edinburgh, entitled "Heliochromy," and published by Wood, of Edinburgh. The name should be Henderson, instead of Hudson, as Mr Taylor has it. Apropos of these heliochromic experiments, looking over a quantity of old Daguerreotype plates, about two or three months back, I came across some of these said heliochromes; and although these plates have been hustled about in the most careless manner possible, bundled on the top of each other, with a scrap of printed paper between, there they were with distinct traces of the coloured pictures still, with the addition of the printed matter with which they were in contact transferred to them.

My experiments at the time referred to extended over a considerable range of chemical combinations, and the results, although interesting in the highest degree, were so perplexing that I very early came to the conclusion that there were certain elementary principles at work in the production of coloured pictures that were not at all understood, or at least very empirically so.

In all my attempts to produce coloured proofs from coloured models, I never once failed to get a picture, but then it was not always a coloured one. At one time the proof would be a perfect coloured copy of the original; at another, in pure light and shade, resembling a glass positive; and then again it would be a negative, and both without the slightest tinge of colour, although the manipulation was apparently identical with that which produced the coloured specimen.

The first specimen I had the pleasure of seeing was one done by Mr. Thompson. There were five or six daubs of very pure, transparent colour, put on a glass and transferred to a silver plate; the colours so transferred were all given, and most decided.

In the days of ammonio-nitrate of silver printing on plain paper, it was a usual experiment to take a piece of that paper, and print from coloured subjects by imposition, and most decided traces of some colours were produced, but not always. I well recollect Mr. James Ross calling my attention to this fact some ten or eleven years ago.

In copying as coloured pictures (a bouquet of flowers) (under Mr Ross's superintendence) furnished by Mr Robert Hunt for his work on photography, the negative was produced by imposition, on ammonio-nitrate paper, some of the colours were copied with a most delicate precision.

I should feel favoured by your finding a niche in your valuable paper for the above facts.—I am, Sir, your obedient servant, Peter Henderson.

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Photographic Notes and Queries.

Irregular Drying of Sensitized Paper.

Sir,—In a recent number of your News I observed some remarks as to the sensitizing solution running into masses on the paper, as upon a greasy surface, thereby causing large white spots on the print.

There having been no remedy given in said remarks, I endeavoured to find out a simple one. I do not pretend to be able to assign a particular cure of the evil, but the following is an effectual remedy, viz.:—

To fold a piece of clean paper, and with the folded edge to wipe off the superfluous liquid; and further, to dry it, if required, with a piece of clean white blotting paper.

Not only will this entirely obviate the evil complained of, but were this plan of drying adopted where there is no such defect in the drying off, perhaps much better prints might often be obtained, as I cannot see the advantage of allowing the solution to dry spontaneously, and so allowing it to sink into the paper, thereby, in my opinion, increasing the difficulty of *toning* and other operations, as well as, perhaps, interfering with the cleanness and permanency of the prints.

I shall be very glad to learn if this plan should be found beneficial. By-and-by I may, perhaps, have some remarks to offer in connection with another evil, viz., "blistering" of the albumen.—I am, respectfully,

Jas. Skinner,
Of the Albion Albumenizing Company, Glasgow.

Dec. 23, 1865.

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Talk in the Studio.

Artificial Light.—M. Sayers, of Paris, has found that a brilliant light, possessing very high actinic power, is produced by the combustion of a mixture of twenty-four parts of well-dried pulverized nitrate of potash with seven parts of flowers of sulphur, and six of the red sulphide of arsenic. This mixture can be sold at threepence a pound, and its light is therefore much cheaper than that of magnesium, to which it is said to be only very slightly inferior in actinic energy.

Artificial Ivory.—An American patent has been secured for a composition of bone-dust with certain other ingredients, whereby said bone-dust is bleached and transformed into a pliable mass, which can be readily pressed into moulds of any desired description, and from which billiard-balls and other articles can be made equally as hard and durable as such balls or other articles made of real ivory.

Mr. Hughes's Portrait of the Queen and Infant Prince.—The *Daily Telegraph*, reviewing the recently published engraving from a photograph by Mr. Hughes, says:—"The photographic origin of this brilliantly-executed work is apparent only in its exactness of detail; for with the higher truthfulness of expression is all the accompanying grace of pictorial arrangement. For this reason, it would seem that Mr Jabez Hughes, of Ryde, the well-known photographer who has furnished the foundation of the draughtsman's and the engraver's handiwork, deserves the first, if not the principal word of praise. Except from a photograph as near perfection as the mechanical art of heliography can ever come, it would not have been possible to produce a picture in black and white so unexceptionable as the royal portrait in question. The disposition of light and shade may have received some heightening of effect, but its general character must of necessity have been the same.

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To Correspondents.

⁂ The Year-Book of Photography.—We have just published our annual *résumé* of the progress of the art, in which we endeavour to epitomize the practice of photography, as endorsed by the ablest men. This year, in addition to condensed statements of the usual processes, with the latest improvements, and terse accounts of new processes, we have had the pleasure of adding many original communications on practical matters of important current interest, from a large number of gentlemen, who have obtained recognition as amongst the ablest practical exponents of the art. The following list of contributors will best suggest the interest of the original communications:—Dr. Diamond, F.S.A., Dr. Hill Norris, T. R. Williams, H. P. Robinson, James Mudd, O. G. Rejlander, Wm. England, Jabez Hughes, V. Blanchard, Russell Manners Gordon, S. Fry, the "Photographer's Assistant," W. B. Woodbury, W. Ackland, Nelson K. Cherrill, J. H. Dallmeyer, H. Cooper, Jun., A. Brothers, J.W. Swan, J. Burgess, and others

Aspirant.—Col. James's work on Photozincography is published by Longman and Co. The price is either half a guinea or twelve shillings, we forget which. It is difficult to state the probable position of photolithography; but we see no reason why complete success, at least for reproductive purposes, should not be attained. It is difficult to form an opinion of a process from one specimen, but that you enclose is not by any means the best we have seen.

An Earnest Reader of the News.—As far as we know, the method in question consists simply in colouring a photograph, which has been made transparent, with oil colours at the back. These colours then show through the picture, and give a pretty effect, but of course not equal to that produced by skilful finishing on the face of the picture. 2. We cannot describe microscopic photography in the space we can give to an answer in these columns. We have had many articles in the News on the subject, and you will find one in our Year-Book, just out. 3. Printing opal pictures by the collodio chloride of silver process is not costly; each picture can be produced for a few pence. You will find details in recent numbers and in our Year-Book.

Fairplay.—The omission of one name out of many in our incidental enumeration, like that of our correspondent, can scarcely be called ignoring. We could mention a dozen other names which might have been mentioned if the writer's object had been to make a complete list.

J. Rumer.—We will notice the matter shortly.

A Subscriber from the First.—The practical details of enlarging by means of the lime light will not, we conceive, be difficult to work out; but will require a few experiments. The solar camera will be used like a magic lantern. Of course the exposure will be much longer than for sunlight—probably varying from five to fifteen minutes. The development, &c., will be the same as for sunlight. We do not know anyone who teaches the method.

R. S. (Cornwall)—An acetate toning-bath, made as you describe, ought to work well if the materials are pure. It is evident, however, that from some cause it is inert. Add a little of an ordinary sample of acid-chloride of gold, which will probably restore its activity. We have not tried the special sample of gold and calcium you name, and we are not familiar with its properties; possibly there is something wrong with some other part of your operations. We do not understand what kind of prints you had which printed to a brick-red in the pressure-frame.

Old Pupil.—A dark coloured collodion will gradually liberate free nitric acid in the bath; but not acetic acid. If the bath contained acetate of silver the gradual accumulation of nitric acid might decompose some portion of it, and thus liberate acetic acid. 2. The sample of collodion which developed rapidly and then became fogged was probably new and more sensitive than the other. 3. It is probable that you are over-exposing, unless there is some diffused light gets access to the plate. But from your description you are using a new and very sensitive collodion, which requires shorter exposure. You may use a weaker developer and one containing more acid. A few drops of tincture of iodine will probably produce an improvement. 4 We do not sufficiently understand your description of your lens. The diagram you give looks like three glasses of different sizes cemented together, which cannot be what you mean.

A. Wood.—The photograph is very excellent. By what process is it taken?

E. M.—Prints by the photo-relief printing process have every prospect of permanency, as permanent pigments are employed. Even if they were "soluble," as you suggest, in water, they would be as permanent as water-colour drawings. But it is possible to render them insoluble or waterproof in various ways. We have seen examples made insoluble by various methods. Mr. Woodbury uses alum for the purpose, and finds it answer admirably.

Several correspondents in our next.

◆

Photographs Registered during the past Week.

Mr. Farindon Lane,
Four Portraits of Rev. Isaac Vaughan.
Mr. T. C. Hammond, Ripon,
Portrait of R. Kearsley, Esq., M.P.
Mr. G. E. Alder, Cheltenham,
Portrait of Mr. Tom Hohler.

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